The Builder.

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The Royal Academy Exhibition.

"LET no one persuade you that it is not an interesting Academy," was the greeting of a distinguished visitor to a lady on Private View day; a sentiment in which we entirely concur, and which is a refreshing contrast to the *blasé* tone of depreciation of everything which is so commonly prevalent on Private View days. It is true that some leading Academicians are not at their best this year; in one or two cases, it is understood, because they have not been able to complete their most important works in hand in time for the opening: and it is true, of course, that there are a large number of pictures which, with whatever average merit of execution, are totally uninteresting and commonplace. This however is always the case, for the simple reason that to a large number of exhibitors art is principally a means of making a living, not an aspiration after any ideal, and their appeal is made to the commonplace ideas of the majority of the public—how commonplace anyone knows who listens to the remarks about the pictures made by the mass of the sightseers—and we doubt if any attempt to alter the standard of the exhibition, to admit only pictures which have an intellectual interest, would be advisable. The line would be difficult to draw in any case; and after all, the Academy Exhibition may be regarded as the representation of the existing condition of English art, its tastes and its standards, and it is better that we should have such an all-round representation once a year; those who do not care for the commonplace work can ignore it, and devote their attention to what is worth their study. The great complaint which we do make, and have repeatedly made, about the Royal Academy Exhibitions, is in regard to the immense preponderance given to painting, and the entire ignoring of the art of design as distinguished from that of pictorial representation. Architecture can only be said to be nominally represented in the small room devoted mainly to small pictures of buildings, which have little interest as pictures and do not illustrate the method of architectural design; and decorative and handicraft art are practically ignored altogether. This is perhaps in part the fault of the public, who crowd to see pictures and are indifferent to design; if we can ever get up a public demand for the illustration of design at the Academy no doubt it would be met.

But we call it an interesting Academy because there are a good many works, a larger proportion than usual, which have a decided individual interest in regard to power of execution and a certain novelty of treatment or of aim. Some of the works which most especially exhibit these qualities do not belong to what are generally considered the highest and most ideal plane of painting. Three occur to us particularly at the moment as paintings which will not be readily forgotten; Mr. Nettleship's drinking tiger (17), Mr. Davis's landscape called "Elder-bush" (103), and Mr. Somerscales' remarkable sea-painting, "Corvette shortening sail to pick up a shipwrecked crew" (434). The tiger is one of the most remarkable pourtrayals of grand brute force that we have seen in painting; it is in itself worth a visit to the gallery, and is perhaps the best thing Mr. Nettleship has done, and is none the worse because he has been content with simply painting the animal and has avoided the temptation to sensational incident or to giving a semi-human interest of sentiment to brute life, which has sometimes tempted him to be more theatrical than truthful. Mr. Davis's exquisite little landscape stands (whether intentionally or not) as a kind of challenge to the view of landscape-painting as mainly the art of conveying the impression or sentiment of a scene in the language of painting, without realisation of details. The subject is only a country lane winding away into the distance, with an elder-bush and a hedge full of wild flowers in the foreground, but it is painted with an absolute truth of detail and of sunlight and shadow which almost cheats the eye, and which is effected without falling into realistic hardness and without losing the sentiment of the scene; in fact the picture affects us almost as if we saw the actual scene. Mr. Somerscales is a painter who has brought forward a new aspect and handling of that inexhaustible subject for painters, the open sea, the difficulties of which are such that each of our few great and successful sea-painters seems to have only mastered one or two aspects of sea. Mr. Somerscales shows the open Atlantic on one of those bright, breezy days when the water is dark under a nearly cloudless sky; there is not wind enough to give crests to the waves; the unquiet tumble of the expanse of dark water is admirably conveyed, and the dull gleam in the hollows of the waves is rendered in a way we have never seen it before in painting. The corvette, with her spread of canvas and her light-coloured hull, stands out brilliantly in the clear air; the cast-away boat near the foreground serves to give scale to the waves; a little more attention to the figures of the men in her might have been desired. It is a satisfaction to us to note that it was an eminent English architect who was among the first to recognise the striking merits of this work by a new painter, and who has secured it as a possession.

To take things in more regular order, and consider the few works which rise above anecdote and incident and deal with ideal design, the President sends no less than five, besides his "Rizpah," which come under this category, of which the most effective in a pictorial point of view is the head entitled "Atalanta" (112), a splendid piece of colour and a fine head; the most interesting is the classic archery lesson, "Hit" (105), an admirably composed group of two nude figures, a man and a boy. "Farewell" (14), a figure under a classic portico turning the head after someone unseen, aims at a sentiment which unfortunately does not impress one as very genuine, and the sky is not at all happy. "Corinna" (224) we cannot admire. "The Frigidarium" (295) is a pleasing decorative study of a woman in semi-transparent red mantle standing above the bath and looking into the water, an architectural background just shows the sky above it. Sir F. Leighton's chief contribution, "Rizpah" (159) will be remembered for the characteristic and determined head of Rizpah, who, with a sickle in her hand, stands on guard against the beasts and birds; but the subject, with the partially draped dead bodies hung in the foreground, is not a happy one for painting, and the picture will not be a favourite. Mr. Tadema's chief work, "Comparisons" (219), shows even less than his usual incident, and even more than usual perfection of execution; the two fine-looking Roman ladies comparing readings in two

books with ivory covers, the marble griffins which carry the table, the veiled light through the curtained window, with the outlines of flowers seen behind the curtain, the brilliant group of flowers in the bit of open window in one corner, and the blue sky and bit of white temple seen beyond —all these are perfect. The other work "In my studio" (113) is a beautifully painted small interior, a perfect study of light and colour in an interior, and equal to the finest work of this class that painting has ever produced. This is not in one sense imaginative work, but it is work which represents emphatically "L'Art pour l'Art," of which there is never too much in an English exhibition. Mr. Orchardson's "Music, When Soft Voices Die" (19), may come under the same heading; it seems as if painted mainly for the sake of the interesting old-fashioned form of upright piano, but the figure is a pretty one, and the picture a harmonious whole. Among more distinctly ideal paintings may be classed the two by Sir John Millais which form pendants in Gallery III.; "Pensive" and "Merry" (204, 217), the first a brunette girl with a pansy ("There's pansies, that's for thoughts"—Ophelia), the second a rosy-cheeked little thing with a canary; they are fine specimens of a class of work in which Sir J. Millais is the artistic descendant of or successor to Reynolds. Mr. Arthur Hughes's picture, "The Door of Mercy" (828), represents a penitent received into heaven by a beautiful benignant angel who leans over her as she kneels, other angels filling up the background, with faces rather hard and set; the foreground group is fine, but the work is not one of its author's best. Mr. J. W. Waterhouse's "Hamadryad" (98) is both a fine pictorial design and a poetic conception of the tree-goddess, standing within and seeming half-incorporated with the hollow trunk of a tree, while a little fawn plays to her outside; but surely she is very long in the leg. His "Belle Dame sans Merci" (149) does not rise to the fateful power of the legend. Mrs. Corbet's "Goat-girl" (27) is a noteworthy work, one of those figures which are more than a mere figure and seem to suggest a poem to the eye; it is a fine piece of colour too. Mr. Poynter sends a very elaborately worked out classic interior with a figure, "Chloe" (199),

"Dulces docta modos et citharæ sciens"—

a fine study of classic detail and ornamentation, as well as a finely-designed figure, but archæologically it does not all seem quite in keeping; the lyre, and the bit of marble carving under the seat, are decidedly Greek, and the filling of the panels under the window is more of Roman or even Pompeian style. The figure of a woman by Mr. Harcourt (321), with no title but a quotation from Keats, is a thoughtful study and an unusual piece of colour. Something may be said for Mr. Bunny's oddly-conceived fancy, "Le Passant" (444) — it is not commonplace at all events. Mr. F. Hall's "Pixy-led" (868) is a pretty fancy and a clever study of effect; in a very different sense the same may be said of Mr. Clausen's "Evening Song" (923), a rustic girl lying in a cornfield in the full light of the evening sun. Mr. Hacker sends a very clever painting under the title "Circe" (928), with Ulysses and the hogs, but as an illustration of the Odyssey it is ridiculous; Circe was a goddess, though not a very respectable one: she had dignity to keep up, she was not a person to be found squatting naked on the floor like a slave girl. If painters go for subjects to the great Greek romances, they should at least try to idealise and not to vulgarise them. Mr. Hacker's other work, "The Sleep of the Gods" (375), is deficient in the same sense; it is merely a study of nude figures asleep on the grass; there is nothing in it to suggest the idea that "Pan is dead"; it is a prosaic study with an ideal title appended to it; that is all. Mr. Watts's charming little cupid, "Promises" (148), is an ideal work of another stamp, and moreover a beautiful piece of colour. Of his "Endymion" (218), we would rather say nothing.

Among what may be classed as historical pictures is the principal work of Sir J. Millais, the child saint, Theresa (42), with her little brother, going out to seek martyrdom. The face of the girl is very beautiful, and accords with the spirit of the story; the contrast afforded by the little boy, more occupied with his orange than with martyrdom, is true to nature. The very decisive painting of a rather peculiar costume draws off attention from what is really the central motive of the picture, Theresa's expression; but the work, though not attractive at first sight, is one which we believe will gain as it is studied. Mr. John Collier's large work, "A glass of wine with Cæsar Borgia" (426), is a remarkably able one in execution, and he has given striking portraitures of Alexander VI., and of Lucrezia Borgia; we should question whether, judging by some engravings from contemporary portraits, he has done full justice to the intellectual *finesse* of Cæsar Borgia's countenance. The telling of the incident is over-emphasised, as things are on the stage, to make sure that every one sees what is meant; no man in his senses would accept a glass of wine from that trio. Mr. Crofts's "Charge of the Light Dragoons at Moodkee" (7) is merely a battle picture, with no central interest. Mr. Seymour Lucas has illustrated carefully and thoughtfully the account of Philip II.'s reception of the news of the Armada disaster, and the picture is an impressive one, though we doubt if Philip's feelings took so religious a turn as here represented. Mr. Dicksee's "Funeral of a Viking" (131) occupies an important position, but we cannot feel interested in it, nor in Mr. Riviere's large painting of "The King's Libation" (87), which is chiefly an opportunity for painting a heap of dead lions. Mr. A. C. Gow paints "The Duke in Spain" (193) with his staff, making inquiries of a native ("local information is the safeguard of the general"); we should question whether even staff horses, in full campaign, are kept as well-groomed as in Hyde Park, but we may thank Mr. Gow for reminding us, by this and another work, "A Spanish Highway, 1812" (767) that we were once a great military power. Mrs. Dicksee, in her picture of little Handel practising in the garret (279), has been fortunate enough to get hold of an incident which will interest everyone; as also Mr. Hillingford, whose large picture of that famous ball in the Rue de la Blanchisserie at Brussels (469) has the merit that one can see what it is at once without the catalogue, and is a spirited work of its class. Far superior to this, however, is Mr. Blake Wirgman's "1793" (566), representing the brutal alternative offered during the Revolution in La Vendée to the Royalist women, to let their children perish with them, or give them up to the care of the Republicans. It may not be a great picture in a purely artistic sense, but the artist has realised the scene to an extent perhaps almost too painful.

From historical pictures we come to what we may call anecdote and incident pictures, of which, however, there are two very distinct varieties. There are the pictures which are painted mainly to tell a story or illustrate character, and those which are painted mainly as studies of artistic effect. In modern criticism it is the fashion to regard these latter as on a far higher level than what used to be called *genre* pictures; a conclusion we doubt the reasonableness of. There is surely more of intellectual interest in expressing character in a face and figure than in merely using it as the medium for a study of colour. Mr. Melton Fisher's "Music" (328) is an exceedingly clever study of the effect of figures seen on a terrace between artificial light and summer twilight, but the figures are of no interest, and it is a great deal of canvas to cover with such an experiment. So with Mr. La Thangue's study of three figures by lamplight, "Punch" (543), of little interest save as an effect. Mr. Chevalier Tayler's "A Summer Dinner Party" (519), a very cleverly painted picture of the same class, is on a more reasonable scale, and there is more of individual character in the figures, which are obviously portraits. Mr. Wyllie's lifeboat picture (47) is spirited, though the relation between the action of the crowd of people pulling *up* the beach on the rope and the evident intended launch of the boat *down* the beach is not made intelligible, and in his desire to get the distressed ship into the picture the artist has got her so near that they might almost have slung the people on shore without the aid of the boat. Mr. Dendy Sadler is quite at his best in "The New Will—Everything to my Wife Absolutely" (83), which is an admirable study of character as well as a very careful piece of painting; "A Meeting of Creditors" (588) by the same hand is also very carefully painted, but it represents a sort of humour which has been worn rather threadbare. Mr. Marcus Stone's "A Honeymoon" (158) is as pretty as his lover's scenes usually are, and as superficial in its sentiment and interest. Mr. Joseph Clark's study of children the "Sweets of Life" (232) is another clever commonplace, as well as his "Unwelcome Guest" (473), which is better, but nothing like equal to the really delicate humour of some of his former productions. "Glass-blowing" (261), by Mr. Colley, is a good work of its class. In "The Lighthouse" (330), Mr. Stanhope Forbes devotes a very large canvas to a picture of a harbour-boat sculled through the sluggish green water, with the pier and a hill as a background; a very able piece of painting, but who cares for such a subject on such a scale? There is really nothing in it except to show how cleverly the artist can paint a dinghy and two men life-size. In "The Interval" (492) and "The Announcement" (605) which evidently belong to each other, though separated on the walls, Mr. J. H. F. Bacon has made a mark by painting with much force and realism two interiors, in the first of which a singularly vulgar type of middle-class woman apparently does the part of affectionate mother-in-law to the girl in the window and her child, while in the second the younger woman appears in deep mourning and the death of the son is announced to the old mother seated by the fire; so we read it. The painting of this second work is admirable in the management of artificial light and in all details, and the author has made a creditable effort at genuine pathos, which might have been more successful had his old woman been less disagreeable in style. Mr. Hall's "Homeward" (518) is a fine gloomy idyll. In "Evening" (863) Mr. Lorimer has shown how to treat the incident of a party of children round a table, and the effect of artificial light, without verging into commonplace; for the large number of children of nearly the same age he ingeniously accounts by the Indian nurse; it is a party where children from India are grouped with the home family.

In portraits the Academy may be said to be strong in the double sense of not having so many as there sometimes are, and including some very fine ones among those. Sir J. Millais' "Mr. John Hare" (18) is admirable. Mr. Sargent, in his portrait of "Lady Agnew" (30), has fortunately shown for once that he can give attractiveness and charm to a lady's portrait without losing the force and character which his often gratuitously eccentric portraits always display. In the same room is a most dignified portrait of a lady by Mr. Seymour Lucas (46), rather recalling Gainsborough in its feeling, and in the treatment of the landscape. Mr. Herkomer's portrait of the "Duke of Devonshire" (130), is a fine one, rather curious in the tone of the face; and we may class among portraits Mr. Kennington's large painting (rather on *Salon* than Academy scale), called "The Queen of Love" (132), of a lady in black seated on a lion-skin, the head of which grins by her side. Mr.

Ouless's portrait of "Mr. G. H. Pember" (154), is remarkable for breadth of execution, and a fine manly down-rightness of style; Mr. Shannon's "Mrs. Arthur and Her Son" (163) is a beautifully composed group, in every sense a picture as well as a portrait. Mr. Tadema has painted a half-length of Herr Joachim; Mr. Fildes's portrait of a lady (185) in Gallery III. we much prefer to the rather hard and staring portrait (247) in Gallery IV. Other noticeable examples are Mr. Seymour Lucas's portrait of an elderly lady (468) in Gallery VI.; Mr. Ouless's "Sir Charles Tennant," admirable and very characteristic both in colour and expression; Mr. Carter's "Miss Butler" (533), a funny little child on a white-legged stool amid artistically arranged draperies; Mr. Gibbs's "Meta: a Portrait" (538), a very interesting and expressive work; Mr. Kennington's "Mrs. Tennyson d'Eyncourt" (883), and Mr. Herkomer's "Sir Algernon E. West" (895), a model of simple and unaffected portraiture. It is perhaps among portrait groups that we should place Mr. Solomon's large dinner-table picture, "Your Health!" (892), at least that the figures are all we believe careful portraits is the only possible excuse for covering so large a canvas with such a subject. The portrait (a very good one) of the engineer of the Forth Bridge is conspicuous in the picture.

In landscape this year's exhibition is strong. Mr. Davis exhibits, besides the beautiful little work of which we have already spoken, "An Orchard in Picardy" (205), in which the same qualities are found on a larger scale, though not perhaps in such perfection, and a larger work, "Loch Maree" (537), as well as one or two smaller ones, in which landscape and cattle are combined, which will possibly be more generally attractive, though not equal in thoroughness of work to the two previously named. Mr. David Murray's two landscapes in Gallery I. (11 and 15), are rather disappointing; "Meadow Sweets" (11), seems too like a reversion to a system of concocting landscape, of a pleasing and facile type, which is inferior to some of his conscientious and original work of former years. On the other hand his large landscape, "Hampshire" (589), though having the air of a composed work rather than a real scene, is quite true to the general character of south Hampshire landscape, and is a grand and monumental work which must add to his reputation. Mr. Leader, in his principal work, "By Mead and Stream" (499), is at his best, and though he has not got rid entirely of that artificial hardness and glitter which is the weak point of his style, nevertheless fascinates us by a remarkable realistic truthfulness of effect in the representation of meadow scenery under bright summer light. Mr. Hook's one work (211) exhibits his usual quality and style, not perhaps quite at his best. Mr. G. Foster's "A Summer Pageant" (322) is a remarkable study of an unusual effect of light and colour on a sea-coast scene, which is one of the most original works of the year, and Mr. Corbet in his "Evening" (336), gives a fine effect of evening light on cornfields, treated in a broad and grand manner. Mr. Adrian Stokes's contribution is a twilight scene "On a Cornish cliff" (480), not quite equal to one or two of his works of previous years, but exhibiting the poetry of sentiment and breadth of treatment which always characterise his work. Among other works to be specially noted are Mr. Nowell's "Approach of Night" (114), a forest scene half pervaded by evening mist, which shows a good deal of originality of treatment; Mr. C. W. Wyllie's "Summer Flowers" (267), a bright summer-day scene on the banks of an estuary; Mr. T. C. Noble's "Twilight" (290); Mr. Bryan Hook's "Hart's Lock Woods" (357); Mr. R. Noble's "Evening" (440), conventional in style, but a fine effect; Mr. Olsson's "Receding Tide" (529); Mr. Joseph Knight's "Clouds Lingering Yet" (856), Mr. East's "The Golden Valley" (837), a large landscape showing a view over a rich undulating country, which, however, rather wants distinction of character; and Mr. John R. Reid's "Poor are the Friends of the Poor" (896), which may be regarded as a landscape with a group of buildings in the foreground, for the figures are of secondary importance, and which in power and freshness of open-air effect is not surpassed by anything in the exhibition.

Sea-pieces are less numerous than landscapes, but they are mostly exceedingly fine, and indeed there is no department of painting which English lovers of art may regard with such satisfaction as sea-painting, for in this at least our own artists may claim to be superior to any others in the world at present, as the French critics cordially acknowledged when they saw some of the work of our marine painters at the 1889 Exhibition. Mr. H. Moore is always, as it were, surpassing himself, and has never done anything finer than his "After a Breeze" (51); and "Hove-to for a Pilot" (246) is not far behind it. Mr. Brett sends one of those wide calm seas in which he delights, under the title "Pearly Summer" (153), in which the shipping are a little more prominent than usual; but he has also sent an important work, "Breakers among the Reefs" (417), in which he has shown the sea under a different colour and aspect, the greener water of a shallower sea, full of foam and movement, and almost, one might say, of the very sound of the sea. Mr. Shaw in his two contributions (592, 925) is perhaps rather too much repeating the same effect and treatment, a very truthful one as far as it goes, but this artist has never quite equalled one or two of the larger and more important works which first brought him into notice at the Academy as a painter who understood the sea, nor perhaps has Mr. Fraser, though his "Easterly Breeze" (369) like Mr. Shaw's two coast scenes, would pass as an exceptionally good sea picture in a gallery of any other nationality.

Among animal paintings is a very fine bold study of the head of a lion by Mr. C. E. Swan (520), and one or two very clever works by Mr. Wardle, who seems rather to aim at an imitation of Mr. Swan's treatment of animal subjects, especially in the two leopards painted under the title "Stealth" (100). We should mention also two or three noteworthy architectural pictures; one by Mr. Woods, "The Cloisters of the Frari Church, Venice" (102), an admirably clear and bright architectural painting, and two by Mr. Logsdail, "In the Piazzetta" (233) and "The Church of the Misericordia, Venice" (451); the latter, which is the smaller one, is the best; in the former, which is a painting on a pretty large scale of part of the ducal palace, the artist has failed to get the character of the columns in the upper story, which as Ruskin has truly remarked, hardly anyone who draws the building does get; they are too thick for their height, and the slight diminution of the shaft, so unusual and characteristic in connexion with the Gothic detail, is not shown.

To the contents of the Architectural Room itself, already commented on in general, we shall return more in detail, and may also have something to say as to the sculpture of the year.

THE LONDON COUNTY COUNCIL AND ITS LAND.

MANY who are unfavourable to the general policy of the London County Council must have smiled with satisfaction at certain facts which were brought out at the meeting of the Council last week. It must be confessed that the County Council has largely contributed to the ill-feeling which exists against it, by the vain and boastful way in which it gave forth its intention to manage its affairs. On the occasion in question the subject of discussion was the report of the Corporate Property Committee on the sale and letting of the Council's land and other property. The tale was a lamentable one; it was in fact a confession that the sale and letting of the Council's property is at a standstill: that the public lets the Council severely alone, and that it is politely boycotted. In these days such a result is the consequence of bad management in some form or another. Land in London can always be let or sold on market conditions and at a proper market rate. "We have had under our consideration," so runs the report, "the question of the Council's failure, not merely to find purchasers, but even to secure bidders for its property at recent auctions." One point which it is suggested is the cause of the want of competition is the fact that a purchaser is required to accept the title of the Council without investigation. The Committee, however, do not think that such a condition injuriously affects the sale. We have no doubt it does. The Council cannot give an indefeasible title any more than the Duke of Westminster or the Duke of Bedford; a purchaser who takes a title without investigation takes upon himself a certain risk. We doubt if any solicitor would advise a client to dispense with such an investigation; and it is quite certain that solicitors would not look favourably upon a purchase which would deprive them of some professional earnings. We do not for a moment say that a solicitor would on the latter ground urge a client not to purchase Council's property, but he certainly would not encourage him to do so. He would not go out of his way to give him information on the subject, and the practical result is that under such circumstances buyers do not come forward. Again, an officer of the Council acts as auctioneer, and this, again, is undoubtedly a powerful factor against competition. The great and active land-selling firms of the Metropolis can nearly always get bidders—it is part of their business—and men so shrewd and experienced can generally carry through such matters. Here, again, the Council have to fight against professional coldness. The land agents of London are not likely to help to sell the Council land when one of their profession is not employed to sell it. But apart from anything akin to wilful professional coldness, it has to be borne in mind that the regular auctioneer has often clients to whom he can recommend property entrusted to him for sale. A mere official is a voice calling in the wilderness. When to these facts are added others, such as the delay which occurs in the approval of plans and in the granting of leases, as well as a general suspicion in regard to the attitude of the Council towards property owners, there is no great reason to be surprised at the fact that the Council is unable to sell its property. The theorists of the Council propose to tax owners of property, and purchasers may well doubt whether, having got the land, they may not find it presently burdened with taxation which they never contemplated. The Council have frightened capital in London, and one result of this is a disinclination by the public to purchase the property of the Council.

In addition, there is also the fact that some part of the saleable property is "in the nature of a residuum, and is not such as can be advantageously dealt with." But if "a residuum," which means, we suppose, an inferior class of property, is on sale, a low price must be taken for it. Judging from the fact that on their own showing the Council are asking thirty-eight to thirty-nine years' purchase for ground rents instead of twenty-five to thirty, on which basis they should be saleable, it is probable that the reserve price for inferior property is too high. But it matters little what reserve is put on property if there are no bidders. On the other hand, persons will not take the trouble to attend an auction whether of land or goods and chattels if they know by experience that there is a reserve price which prevents the transaction of business. In fact the report of this

Committee shows that what has been wanting in this department of the Council's affairs is business capacity. The same capacity has been conspicuously absent in almost every department, and amateurs cannot successfully manage a great concern.

At the same meeting the Council discussed some draft clauses to insert in the London Building Law (Consolidation) Bill to prevent buildings being raised to an undue height. This rule, if it becomes law, will be important, but it will be time enough to point out these provisions when the Act has passed. The most satisfactory feature in regard to the proposals made on this subject is the indication of a desire to regulate the height of buildings in future in relation to the width of the street. It is in this direction that improved legislation is specially required.

NOTES.

A LARGE competition is on foot in the States for new Municipal Buildings for New York. The instructions were formulated about a month ago, but the drawings are not to be sent in till September 1 of this year. Six designs will be first selected by the Board of Commissioners, assisted by a committee to be nominated by the new York Chapter of the American Institute of Architects, and the Architectural League of New York, and the architect of the best design out of these will be commissioned to carry out the building, "provided that his professional standing is such as to guarantee a proper discharge of his duties," the other five receiving five equal premiums of 2,000 dollars each. The building is to stand in the City Hall Park, and is to be built of marble (how refreshing that sounds!), and to supply accommodation to the extent of 270,000 square feet, distributed over three stories, exclusive of basement and attic. One very sensible clause in the instructions is that "it is desirable that none of the courts that are provided for light and air shall be inclosed on more than three sides," a piece of sanitary common sense left on record by the builder of Caius College more than two centuries ago, but absurdly forgotten in some great modern English buildings. Nothing is said as to limit of cost. The architect appointed is to be paid on a scale of 5 per cent. on the first million dollars of cost, 4 per cent. on the second, and 3 per cent. on the remainder.

THE advocates of Imperial Penny Postage must, for the present, be content with the "moral support" and sympathy of Parliament, and wait until more favourable times for anything more substantial. In the debate on this subject last Friday, the present Government simply re-affirmed the decision of the last Administration in agreeing with the principle, but indefinitely deferring action. Apart from the anticipated loss of revenue which the proposed change would involve, it is held to be absolutely necessary before making it to obtain the unanimous consent of the parties to the Postal Union, or commit a breach of good faith. The latter obstacle is, of course, fatal to the immediate adoption of this desirable reform, as the concurrence of the countries interested is, at present, doubtful, and some time must elapse before there is another general conference. As the reform was advocated by members of each political party, so its impracticability was demonstrated from either side of the House; and Mr. Henniker Heaton and his supporters were fain to accept the assurance that the Government desired at the proper time, "when it might be done without reproach of conscience or honour," to carry out their wishes. Great things have already been accomplished in the way of postal reform, and there is certainly no cause for discouragement in the tone of the recent debate.

THE case of Haggerty *v.* Thompson, decided last week by the Queen's Bench Division on appeal from the County Court Judge of Leeds, is not of importance from a legal point of view, though it has practical value. It shows the great importance of careful superintendence where complicated machinery is used. The plaintiff was injured by a portion of a crane falling on him when engaged as a labourer carrying bricks on to a scaffold. The crane was safe so long as it was well managed, but was very dangerous if imperfectly worked. The cause of the imperfect working of the crane, whereby the plaintiff was injured, was the fact that the man who was working it was ignorant of the proper way to manage it, because the foreman had never given him proper instructions. The foreman being "a person in superintendence" within the meaning of the Employers' Liability Act, the defendants were liable for the injury caused to the plaintiff. This is one of the cases which shows the hardship of the Act so far as employers are concerned, though at the same time it would have been equally unfortunate if the injured man could not obtain compensation from someone. Workmen are not, to use a common expression, "worth powder and shot," and so the law has made the master liable for their negligence, though he is quite guiltless of any personal carelessness.

IN the ceremony of opening the Chicago Exhibition the Americans seem to have shown their usual eye for sensational effect, in bringing within the reach of the President's hand an electric communicator, which enabled him, at the right moment, to start all the machinery in the exhibition at the culmination of his speech. This is a hint for effect at the future openings of great exhibitions which will no doubt be borne in mind. At the same time we cannot help thinking that if the American managers of the exhibition had thought less of such tricks of effect, and more of getting the exhibition in order for the opening day, they would have done even better for the credit of the undertaking. According to the *Times'* correspondent, the American section is still in a chaotic state, and it must be some weeks before it can be really in order. It is gratifying to read that the English section is one of the portions which has been practically finished and ready for the opening; but this section has been under unusually good and business-like management.

THE refusal of the House of Commons to accept Sir A. Rollits's amendment to the Railway Servants (Hours of Labour) Amendment Bill, requiring the railway companies to submit to the Board of Trade a classified schedule of the hours of attendance in signal-boxes, was in our opinion quite justified. The Board of Trade could not possibly act on the information without practically taking the responsibility of this department of railway management off the shoulders of the companies and on to their own, an idea which is perfectly Utopian and impracticable.

THE report of the coroner's inquest on the death of Filippa Vercellino, a poor little Italian infant who has succumbed, apparently, to the effect of the unhealthy conditions of her father's home in Edward-street (Wardour-street), shows that there is something very inefficient in the action of the sanitary authorities of the Westminster Union. The room, a cellar, was damp, "in fact quite wet," and had been condemned a year since by the sanitary authorities as unfit for habitation, but this unfortunate family had been living in it paying 3s. a week rent to a landlord who forbade them to have a light "for fear the authorities should find out that the place was inhabited." But surely the sanitary authorities ought to be able to keep their eyes open sufficiently to prevent such disgraceful and inhuman tampering with their orders. The verdict was that the child's death was accelerated by the insanitary condition of the dwelling. It is to be hoped this melancholy and discreditable event may at least have the effect of putting the sanitary authorities of this and other districts on the alert to guard their flocks against being preyed upon in this way by scoundrels without heart or conscience.

THE *Dumbarton Herald* published last week the text of the memorial drawn up by the Council of the Society of Antiquaries of Scotland in regard to the condition of Stirling Castle, for consideration by Mr. Campbell-Bannerman, the Secretary of State for War. The Society lament greatly "the ruthless manner in which the buildings have been treated, to suit temporary purposes, in utter disregard to their historical or architectural interest, and the trumpery character of the new work," and urge at the same time that they are not so far destroyed but that they might be restored to something of their former condition if the military authorities were willing to give up the use of the castle. Mr. Campbell-Bannerman, in his reply, states that a special visit of inspection to the castle had convinced him that the existing disfigurements, made at a somewhat remote time, could not now be corrected "without such changes as would modernise the building according to the fancy of some modern architect." He thinks it better, therefore, to leave them alone, and to keep the exterior, especially the decorative work, in good repair; and where repairs are executed, to see that they are done by some competent person. If the interior is really in such a state that removing the more modern excrescences would mean what is generally called "restoration," we are inclined to think that Mr. Campbell-Bannerman is in the right, and that it is best to leave well alone now.

WE referred last week to some correspondence in the *Standard* complaining most unreasonably of the interference of the sanitary authorities at Folkestone in endeavouring to compel residents to adopt the best methods of sanitary appliances, drainage, &c. From a correspondence in the *Hythe and Sandgate Advertiser*, of which a copy has been sent to us, it now appears that it is the proprietor of the *Standard*, who has a house at Folkestone, who has been resisting the action of the authorities, and that letters to the *Standard* by Dr. Louis Parkes and Mr. Arthur Baker have been suppressed in that journal so far as they were adverse to the position taken up by the proprietor of the *Standard*. Comment is unnecessary.

AS is reported in another column, Mr. Ernest Turner has made a formal appeal to the London County Council against the action of the Fulham Vestry, in demanding 6 in. drains for some small houses in their district, and has obtained a decision, which is unquestionably a right one, in favour of 4 in. pipes. This is a very useful action on the part of Mr. Turner, and may have an important effect in preventing unnecessary and mistaken requirements on the part of vestries in the matter of drainage.

IN the Fourth Annual Report of the Highways and General Purposes Committee of the Gloucestershire County Council are some remarks in regard to waste land by the side of main roads which are worthy of attention. The Report says that on this subject—

"Great misconception appears to prevail. In the first place it may be stated that the County Council simply inherits the rights and responsibilities of its predecessors, the Highway Authorities. These authorities have, in many parts of the county, ignored their duty in times past as regards waste lands. Those duties may be said to be to protect and safe-

guard the right of the public to the free use of the land from fence to fence, or hedge to hedge, whether the whole intervening space, or only part of it is metalled. Any obstruction placed within these limits is a public wrong, to which nothing short of an Act of Parliament can give a legal or valid existence. The owners of land adjoining main roads cannot, nor can their tenants, lawfully enclose any part of the strips of wastes which lie outside their fences or hedges; and even if the consent of a Highway or other Authority has been given, this consent is utterly immaterial, for it was unlawfully given, and no encroachment can bar the public, no lapse of time limit its rights.

It is the duty of the County Council to preserve the public right to the wastes, and the Council has no power to consent to an enclosure, even though any one should be willing to pay a rent for land so enclosed.

The public right, however, is simply the right of free passage over the surface of the land, and includes no claim to the freehold, or to anything that may grow on the waste."

ONE or two correspondents in the *Manchester City News* draw attention to what seems an extraordinary anomaly in the procedure of the Manchester Corporation in regard to tenders for contracts. It appears from the correspondence that it is not the practice of the Council to publish the tenders, and that the ratepayers have no means of knowing whether the lowest tender is accepted or not. This is not only unfair to the ratepayers and inconvenient to the contractors, but it is bad policy for the Council, as a representative body. Publicity is the best means of securing confidence.

IT was announced last Saturday that the First Commissioner of Works has decided to throw open to the public on and from Whitsun-Monday next, the Home Park between Hampton Court and Kingston Bridge. This return to a state of things which existed about forty years ago, follows upon a movement that some inhabitants of Kingston began in May, 1890, when the herds of deer had been removed, and the park given up to purposes of the royal stud, being let to the Crown Equerry for about 800*l.* per annum. A leading part in the movement was taken by Mr. Gould, Alderman of Kingston, who will be remembered for his share in the freeing from toll of some of the Thames bridges. Covering about 750 acres, and screened from the high road by an old brick wall, it forms part of the 2,000 acres which Cardinal Wolsey acquired when, in 1514, he became possessed of the Knights Hospitallers' Preceptory. Norden (*temp.* James I.), describes the parks appertaining to the Palace as being enclosed, save on the river-side, by high walls; one park being reserved for "deer," the other for "hares," and it is believed that the former corresponds with what is now called the Home Park. In a letter about his application for the mastership, in succession to Dr. Thomas Burnet, of the Charterhouse, Steele writes to Lord Chief-Justice Parker:—

"The matter of being elsewhere employed is nothing but that I have an income out of the playhouse as patentee, and am surveyor of the stables at Hampton Court, where I have nothing to do but to give in an estimate in case they want being repaired." —[1715].

He had built for himself a little house, which he named "The Hovel," at Hampton Wick, whence he dated the dedication of his "Tatler," vol. IV. We read in the "Ambulator" for 1820, that by the exertions of Timothy Bennet, shoemaker, of Hampton Wick, who died in 1752, was secured a right of the foot-way through Bushey Park.*

A QUARTERLY antiquarian magazine is shortly to be issued under the title of *The Illustrated Archæologist*, under the editorship of Mr. J. Romilly Allen. A well-illustrated periodical at a moderate price will be a useful addition to archæological literature, and may perhaps do something to render this class of subject more popular than at present. Mr. Romilly Allen's name as editor is a guarantee that the new magazine will be a well-informed one.

* See also Mr. E. Law's "History of Hampton Court Palace," vol. iii. (1891).

THE exhibition at the New Gallery, now open, is not one of the best that has been seen there. There are some fine portraits, notably the remarkable one by Mr. Sargent of a lady in a rose-coloured dress, which is one of the pictorial sensations of the year. More detailed notice we must defer to another occasion.

FROM a paragraph in the *Sheffield Telegraph* (quoted elsewhere in this issue), it appears that Lord Grimthorpe, in carrying out a new church near Doncaster, at his own cost, has this time elected to employ an architect, who is preparing the plans from sketches supplied by Lord Grimthorpe. We should fear the architect will be likely to have rather an uncomfortable time of it.

ONE conclusion we have come to very decidedly in regard to the Royal Academy exhibitions is, that the rooms are most inadequately ventilated, and that this is a matter which ought to be seen to. Everyone knows that a visit to the Academy during the crowded days of the earlier part of the season is one of the most fatiguing forms of recreation that one can be exposed to, and Academy head-ache and Academy back-ache are almost recognised forms of debilitation. Those who have the opportunity of comparing experiences when the rooms are comparatively empty, as on "Varnishing day" and "Press day," can bear witness that these disagreeable results do not arise from a visit to the Academy on those days. The debilitating effect so much complained of by the ordinary visitor is mainly the result of bad air — insufficient oxygen for the consumption of the crowd. There are several architects in the Academy: are they too much taken up with art to see that the rooms are properly ventilated?

LETTER FROM PARIS.

THE opening of the Salon rather throws into the background various special exhibitions opened last month, and which have not yet closed. That of the Pastellistes, which will close to-morrow, has this year been inferior, both in quality and quantity, to those of preceding years. Among the 134 works exhibited, we may mention the curious experiments of M. Besnard, the fine studies by M. Roll, the portraits by M. Jas. Tissot, the Parisian scenes of M. Billotte, remarkably realistic in effect, and the vigorous landscape studies by M. Lhermitte. The remainder are worse than mediocre.

The exhibition of "Peintres-Graveurs" has opened for the fifth time. The works of M. Israël, "Le Vieux Pêcheur" and "La Femme du Pêcheur," show a powerful realism which recalls Millet. The landscapes of M. H. Rivière are good; the Parisian belles of M. Helleu have a special charm, and M. de la Touche has also done well. We may also mention the dry-point etchings by M. Goeneute, the military scenes of M. Jeanniot, the engravings by M. Guérard after Manet, and the remarkable views of London by M. Pennell, which seem reflections of the talent of Whistler. It is to be regretted that among a remarkable collection there is only one insignificant example of the work of the master of French engraving, M. Bracquemond.

The second exhibition of the "Rose Croix" has this year been organised at the Champ de Mars, where among a number of eccentricities one is almost surprised to find the work of such real artists as MM. Desboutins, Arnaud Jean, Chabas, Léon, and Osbert. The last-named artist exhibits some decorative panels which are very interesting. One ought not to pass without mention the work of M. Khnopff, who reminds one partly of Mr. Burne Jones and partly of Mr. Tadema. For the rest, the "Rose Croix" exhibition tends to become more and more absurd.

On the 10th the Champ de Mars Salon will open, where, as already mentioned, there is to be for the first time an architectural section. This innovation is due to MM. Baudot and Frantz Jourdain. It is announced that MM. Paul Gout (architect of the Lycée Racine), Vincent, Benonville, and Calin will contribute to this portion of the exhibition, to which the last-named will send his design for the Casino for Biarritz. M. Baudot is to exhibit the plans, section, and elevations for the Hôtel which he has just built, and also drawings of the architectural details and of the chimneypieces and furniture executed from his designs by MM. Delaherche and Guérard.

Madame Meissonier, after the discussions which have taken place in regard to the interest of the children in their father's works, seems to have determined on a kind of opposition exhibition of the works of the master, a proceeding the wisdom of which may be questioned. No doubt, as a posthumous homage, the Ecole des Beaux-Arts, where this second exhibition is held, is a more important place than the Georges Petit Gallery. But the collection is hardly worthy of this solemn official locality, while that in the Rue de Sèzes, with its innumerable works from the most celebrated and highly-finished pictures to the slightest studies, formed a collection entirely out of the common run, and a far better and more representative illustration of the artist's genius. The new exhibition contains, on the other hand, very little of his most characteristic work. There are various models made for study—"Duroc," "Le Trompette Louis XIII.," &c., and some interesting works, such as "Les Prisonniers d'Etat," "Les Cavaliers dans la Fôret," "Les Ruines des Tuileries," and the sketch design for the decoration of the Panthéon. It should be added that all these works will belong eventually to the national museums, to which Madame Meissonier has promised to leave them.

The remarkable energy displayed by M. Guimet in the arrangement of his fine museum of Oriental work might be an example for the managers of the French National Museums, whose want of enterprise is almost proverbial. Hardly a season passes that he does not invite scholars and artists to see a new and useful collection. Not long since, he gave us a curious collection of Japanese engravings; and in the last few days there has been a new gallery opened of objects obtained during French explorations in Asia, which have been long hidden away in the cellars of the Trocadéro. We have not space to enumerate all the objects of interest in this last collection, but may mention especially the casts of details from Khmer obtained by MM. Delaporte, Aymonier, and Fournereau; the objects brought by M. Saint-Paul Lias from Indo-China and Cambodia; those sent by M. Groot, which give a curious illustration of the religious and domestic ceremonies of China; and lastly the collection of M. Varat, which enables one to trace the relations existing between the art of Corea and that of Japan. These collections are of far more interest and value than that at the Louvre forming part of the "Musée de Marine," which, interesting enough in itself, is out of place there and moreover encroaches on space that ought to be devoted to paintings. The models and other objects which comprise the Musée de Marine would have their proper place in the Conservatoire des Arts et Métiers and in the Ethnographical Museum; and the Parisian press has been, not without reason, demanding this alteration, which would permit of the enlargement of the artistic collections, for which space is now wanting. It is to be hoped that the Government will eventually see its way to making this change and giving the whole space at the Louvre and in the Pavillon de Flore to works of art, which may then perhaps be all as well seen as the pictures in the National Gallery of London—the arrangement of which appears to French visitors to be admirable—instead of being in many cases hung at a height of eighteen or twenty feet from the floor for want of space elsewhere. This necessity for making the most of the space at the Louvre is the more pressing from the fact that the donations made to our national galleries are almost daily increasing. Among the latest are those of M. Destouches, among which figures the fine sketch made by Guérin for his picture of "Dido and Æneas," a splendid portrait by Ingres, and three fine drawings by Géricault. We may mention also that M. Uhde's fine painting of the "Last Supper," which attracted so much notice at the Salon of 1887, and at the 1889 exhibition, has been purchased by the State for the Luxembourg Museum.

The new Municipal Council of Paris, elected a few days ago, will have to occupy itself, among its first business for next session, with the completion of the Sorbonne, of which the portion facing the Rue des Écoles alone is completed. It is true that the second portion of the work, abutting on Rue Cujas, will soon be completed. But the whole central portion remains to be carried

out, which will surround the ancient church in which is the marble tomb of Richelieu. The work still to be done will cost 7,200,000 francs. An astronomical tower, of a fine design in a decorative sense, will be erected in Rue St. Jacques, for the study of the management of that class of optical instruments which do not require the absolute stability of an observatory properly so called.

Among other important works on the left bank of the river may be mentioned the construction, to be shortly carried out, of the new terminal station of the Sceaux railway, which (contrary to the first intention) will not be placed between the Boulevard St. Michel and Rue Gay Lussac, but on the Boulevard St. Germain, where the Cluny Theatre now stands. There is talk of rebuilding this latter on the Place Saint Michel; and it is to be hoped that the architects will profit by this opportunity, and that of the Opéra Comique, to study thoroughly the problem of a truly commodious theatre, where the spectators, while conveniently placed, may at the same time find the exits, in case of accident, ample and easily reached. Paris is badly off in this respect, even in the theatres partially supported by the State funds, in which the least panic would be followed by a disaster as lamentable as that of the Opéra Comique. When a thoroughly satisfactory theatre s at last constructed, all the others will soon be obliged to follow suit in the reform which the public has so long demanded in vain.

The late Council, before it broke up, had formulated an opinion unfavourable to the scheme brought forward by the Paris, Lyons, and Mediterranean Railway Company for the enlargement of the Gare de Lyon, the deficiencies of which have long been a subject of public complaint. The Council, adopting the scheme drawn out by the City Engineers, has declared itself in favour of a station built in two stories, to which vehicles and foot-passengers could have access on the level, without the trouble of mounting up inclined planes and flights of steps.

The Académie des Beaux-Arts will shortly proceed to fill up the place left vacant by the death of the painter Cabat. The artists who have already come forward as candidates are MM. Joseph Blanc, Benjamin Constant, de Curzon, Harpignies, Maillard and Aimé Morot.

We have to record the death, at the age of seventy-two, of a distinguished engineer, M. François Eugène Gignon, honorary vice-president of the "Chambres Syndicales de l'Industrie et du Bâtiment," and honorary president of the "Chambre Syndicale des Entrepreneurs de Serrurerie et de Construction en Fer." The death is also announced of M. Murat, architect, of Paris, at the age of sixty-one, and that of M. Alfred Chapon, architect to the Suez Canal Company, at the age of sixty-eight. In 1867, since the Universal Exhibition, he had carried out numerous works at Tunis and Morocco, and was also architect of the buildings of the company at Suez, and of various country mansions in France and Spain. He was a pupil of the Ecole des Beaux-Arts and Chevalier of the Legion of Honour.

Lastly, we record the death, at the age of fifty-four, of M. Frank Géraldy, an "Ingénieur des Ponts et Chaussées" of great merit, who had specially devoted himself to electricity, and was director of an important Parisian company with which the house of Rothschild was connected. M. Géraldy was a scientific man of the first order, as well as an eloquent popular speaker on the subjects of his special study, as his lectures and speeches have often shown. His loss is much felt n the scientific world of Paris.

HYGIENE IN ITS APPLICATION TO THE ARRANGEMENT OF BUILDINGS.*

I HAVE chosen the subject of hygiene in its application to the arrangement of buildings because it has fallen to my lot during the last twenty-five years to pay particular attention to, among other matters, the condition of the occupiers of a variety of different residential buildings in so far as that condition has been affected by the arrangement of the buildings in which they have resided. And I have had the opportunity of criticising the plans of many such buildings and of additions and alterations to already existing buildings; and I have also in many instances been able to observe the result, years afterwards, of arranging buildings in particular fashion. I have further had the benefit of association, on nearly all occasions, with medical colleagues who have assisted me with their special training and knowledge. Having had the advantage of such experience, it seemed to me, when I was invited to give a lecture before the Architectural Association, that I should best consult the wishes of the members if I endeavoured to lay before them some of the results of that experience.

It may be well at the outset that we should be reminded of some of the various ways in which a building may affect the health of those who have to occupy it, and in saying this I particularly wish to guard myself against being understood to imply that any of the defects to which I shall refer, are themselves either the *sole* cause or the *certain* cause of the injury to health with which they are connected. It is probable that such evil results as do occur are brought about by a combination of conditions tending, during a longer or shorter period, to induce a state of health rendering the individual peculiarly susceptible to the particular disease that ultimately developes, and thus prepares the system to serve as a favourable soil for the progress of the disease. The *arrangement* of the building is one, and probably one of the most important factors in the causes of damage to health.

There appear to be three distinct sets of defects in a building which tend, in different ways and with different degrees of expedition, to bring about damage to health, and to foster, if they do not directly produce, conditions favourable to the development of certain specific diseases; thus what are most commonly spoken of and popularly understood as "sanitary defects" are probably the quickest to produce visible effect upon health, and are those which have been so aptly described as "filth diseases," and which convey, if they do not actually cause, enteric fever, cholera, diarrhœa, and other disorders of the bowels produced mainly by excrement-poisoned air and water.

A second series of sanitary defects, entirely different and slower in their operation on the human subject than the last referred to, is that which tends to disorders of the bronchial type and to rheumatic complaints, to pneumonia, and in a great measure to phthisis and lung disease. This series is concerned with insufficient protection from extremes of temperature and from the effects of dampness and wet subsoil.

A third series of sanitary defects, and probably slower than either of the last, though undoubtedly not less certain in its effect, is the cause of a large amount of phthisis and other pulmonary diseases, of typhus fever, and of ophthalmia, as well as affording a means of intensifying and spreading such zymotic diseases as smallpox, scarlet fever, &c., and likewise of encouraging depression and a tendency to mental complaints. These are more or less distinctly caused, or at any rate fostered, by insufficiency of air-space, over-crowding, excessive aggregation of persons in one enclosed atmosphere, deficiency of light and of sunshine.

It will be seen that the first of these three series of defects has to do mainly with drainage and water supply; the second relates chiefly to defective construction of walls, foundations, and roofs; and the third to *arrangement* of buildings with regard to air supply and ventilation, light, and distribution of occupiers.

It is this last-mentioned series of defects with which we are chiefly concerned on the present occasion. But I do not propose to occupy time by discussing the details of arrangement in regard to such matters as aspect and exposure to sunlight, air supply, and ventilation.

That the influence which is exercised on the health of the inhabitants of a building by the particular arrangement of the building has, for upwards of thirty years, been recognised in regard to certain classes of building will readily be admitted when we bear in mind that an ordinary hospital for a considerable number of patients is now always subdivided into separate blocks or pavilions, instead of being constructed in one single block of huge dimensions, as was formerly the case.

The sick, above all, need the best hygienic arrangements in order to ensure and expedite their recovery, and wherever those arrangements do not exist, it is not difficult to detect the prejudicial effect upon the patients in the aggravation of their complaints, or the undue slowness of their recovery, and the tardiness of the healing of wounds, or possibly in graver indications of unwholesome conditions. We have all read, for example, of the difficulty of preserving the patients in a maternity hospital from the ravages of puerperal fever, and in surgical hospitals, from the incursions of erysipelas.

Ever since the disastrous arrangements for the treatment of the sick and wounded troops in the Crimean campaign, 1853-55, the pavilion system of hospital construction has been accepted as possessing vast advantages over the older plan of arranging an unlimited number of patients in wards piled up several stories in height, and often all round a quadrangle, as was the case in many old hospitals in all the countries of Europe. But even this pavilion system of construction, though undoubtedly right in principle, is now not infrequently terribly abused, as will presently be explained.

In hospitals for the reception of persons suffering from any of the infectious fevers, again, it is obvious that the hygienic *arrangement* of building has peculiar importance, since it is of the highest consequence that a patient admitted with any such infectious complaint must be so placed as not to risk contracting any other infectious disease during his stay in the hospital, and likewise so that a person sent there under erroneous diagnosis may be dealt with with reasonable safety to himself as well as to other patients in the hospital. These special conditions obviously necessitate a special *arrangement* of building.

But it is not the sick alone who need peculiar hygienic arrangement in the building they occupy. Those who are reputed to be in proper health, both of body and mind, equally need care in regard to the arrangement of the building they occupy if their health is to be properly maintained, and wherever considerable numbers have to occupy the same building, as in an institution, the arrangement of building becomes a matter of vital importance.

Let us consider, for example, the subject of military barracks. The occupiers of these buildings are usually men in the prime of life, more or less in robust health, and selected after medical examination with due regard to their health conditions. And yet experience in the past has shown that unhealthy and badly-planned barracks have, in time of peace, killed or incapacitated the soldier to an extent almost equalling that of the most sanguinary wars. In our own army it was only after the Crimean War that public attention was directed to the subject. In 1857 it was found that, while the death-rate of the male *civil* population between the ages of twenty and forty years was 9·8 per 1,000, the mortality among the troops was 17·11, or nearly double. Subsequently an improved system of barrack construction was introduced which led to a considerable reduction in both the mortality rate and the sickness of the troops; for whereas in 1857 the mortality among troops had been nearly double that of the male *civil* population of the same age, in 1876 the mortality among the troops had been reduced to nearly two per 1,000 *less* than that of the corresponding civil male population, and the hospital accommodation needed for troops has been diminished from 10 per cent. to 6 per cent.

In the French army, after the Franco-German war, similar improvements took place. Mons. Tollet writes that during the ten years ending 1882, France lost 40,000 men in the barracks, while some 60,000 men, who had entered the service in good health, were discharged on account of illness or infirmity. True, typhoid fever, consequent on bad drainage arrangements, was the cause of a large proportion (12,000) of the deaths, but that destructive lung disease, phthisis, appears to have been the main cause of this terrible loss. The success which has attended the improvement of barrack construction in our own country has been noted in certain other countries. In France particularly large improvements are being made. Mons. Tollet and Mons. Emil Trelat have paid high tribute to the work done in this direction in England, and both of them have urged on their own Government the extreme necessity for similar reforms in France. This is being gradually, though slowly, carried out, and Mons. Tollet has constructed several barracks arranged on improved principles under which the buildings comprise a number of one-story detached blocks each to contain only a comparatively small number of men. In our own country the new barracks constructed under the Military Forces Localisation Act, 1872, comprise a number of wholly detached blocks, the residential blocks being restricted to two stories, and holding some 80 to 120 men.

As with barracks, so with many other classes of building intended to hold a number of human beings. If we look at the modern prison we find the same subdivision into blocks or pavilions is now regarded as essential as in the case of a hospital. Wormwood Scrubbs Convict Prison is perhaps the best example of a recently-built prison in this country. It comprises four main

* A Paper by Mr. P. Gordon Smith, F.R.I.B.A., Architect to the Local Government Board. (Read before the Architectural Association on Friday, April 28, as elsewhere mentioned.)

pavilions and numerous smaller blocks, all detached one from another, affording accommodation, including hospital, for nearly 1,500 prisoners, and a large staff of officers. A similar arrangement, but with greater subdivision, has been adopted in the new French prison at Nanterre, near Paris, which holds about 1,000 men and 500 women. These prisons affords a strking contrast, as regards arrangement, when compared with the prison of former days, such as Newgate and the Penitentiary at Millbank, or even the "model" prison at Pentonville, in all of which aggregation of human beings in one block of buildings—in one enclosed atmosphere—was the common plan. In the still older prisons which John Howard has so graphically described, it is certain that ignorance of the laws of health caused many of the prisoners to die, and a still larger number to be seriously crippled for life. Howard reports that "many of those who survive their long confinement, are by it rendered incapable of working. Some of them by scorbutic distempers, others by their toes mortified or quite rotted from their feet; many instances of which I have seen." Howard made some valuable recommendations for obviating the defects of old prisons when a new prison was to be erected; one of these recommendations being far in advance of his time. He says, "That part of the building which is detached from the (surrounding) walls and contains the men-felons' ward may be . . . . *raised on arches* that it may be more airy;" also "the infirmary or sick wards should be raised on arcades"—a plan which in recently-erected hospitals which I have seen both in France and Germany, and to some extent in England, has been adopted for hygienic reasons.

In large modern workhouses it is customary to subdivide the buildings, even those for inmates in health, into separate blocks or pavilions, and to limit the number of paupers in each block to some moderate number, according to the class for whom it is intended.

And so, too, with regard to lunatic asylums, which are no longer arranged in one huge block of building, as at St. Luke's and at Bethlehem Hospitals, at Hanwell, and Colney Hatch, but are invariably constructed in a series of more or less distinct blocks or pavilions, each to hold a certain moderate number of patients, and so that the sun in clear weather may shine between the blocks, and at some time during the twenty-four hours into all the rooms. For it has to be remembered that light and cheerfulness, which are so necessary for all, are specially useful in the treatment of all mental diseases.

Nor must it be supposed that the arrangement of building is of importance solely to buildings of the institution type. It will suffice here for me to point out that persons who reside in cottages arranged on the principle of what is known as back-to-back houses are peculiarly subject to prejudicial effect of the hygienic defects inherent to that system of house construction. This is very clearly shown by the following table, which has been adapted from a report upon back-to-back house construction, which Dr. F. W. Barry and I prepared for the Local Government Board in 1888:—

No. of Registration Districts.	Population (1881).	Percentage of back-to-back houses.	Mean Annual Death-rate per 1,000 of the Population for Five Years 1879–1883.				
			All Causes	Principal Infectious Diseases.	Phthisis.	Other Pulmonary Diseases.	Diarrhœa.
9	8,713	0	27·5	4·5	2·8	6·6	1·42
13	11,749	23	29·2	4·8	3·3	7·8	1·55
12	11,405	56	30·5	6·5	3·6	7·9	2·12
1	892	100	38·4	8·7	5·2	9·2	3·36

The districts referred to are certain of the 1881 Census-enumeration districts, and it will be seen that as the percentage of back-to-back houses to total houses increases, so is there increase in the mortality rate from phthisis, in that from all causes, and likewise from certain other specified diseases. The importance of these rates is all the greater because, with the exception of the means of through ventilation, the back-to-back houses in the district in question, were, as a whole, in a better sanitary state than the through houses.

I have thus far endeavoured to show that the health of the dwellers in sundry kinds of buildings depends to a great extent upon the arrangement of the building in which they live, or at any rate that the arrangement of building may influence their health conditions. In the case of general hospitals, as I have said, this is very generally recognised, since the conditions under which a patient may be maintained during his stay in hospital may either expedite or retard his cure and discharge. But if it be admitted that certain good hygienic arrangements of building are really useful for the *sick*, it can scarcely be denied that those same arrangements are at least desirable for those who are reputed to be in health, and might be useful as auxiliary means of maintaining a certain degree of healthiness. The value of the hospital arrangement of building, or of some modification of it in the case of barracks, prisons, asylums and workhouses, as an agent for the prevention of disease, is, as I have shown, now very generally recognised; but I notice that very many residential institutions, intended to receive large numbers of persons reputed to be in health, are still frequently erected on an obsolete and defective plan. This is specially the case with charitable institutions of all kinds, and particularly so with institutions for the reception of children.

Nearly all institutions which depend for their very existence upon voluntary support are, more or less, crippled for want of funds, and their usefulness often leads those who have the management in their control to endeavour to do more than the available funds will permit to be done properly. Thus we find schemes are frequently promulgated for extending or rebuilding all sorts of institutions, such as orphanages, asylums for idiots, the blind, the deaf and dumb, waifs and strays, and all kinds of schools, in regard to which the chief aim of the promoters is to so enclose a building as to afford shelter to the largest possible number of individuals which the available money will permit.

Now for the class of institution to which I refer. There is, so far as I am aware, no code of rules for the guidance, in a hygienic sense, of those concerned. Hospitals have been written about almost *ad nauseam;* barracks are designed and built more or less directly under Government control. Lunatic asylums to a great extent follow hospitals, and come in for the criticism of a responsible department of Government. So, too, do workhouse buildings of all kinds, and prisons are dealt with directly by Government. Public elementary schools again come in for official criticism, but residential schools (with the exception of those for pauper children) and charitable institutions of the kind generally, are subject to practically no superior control whatever in regard to the arrangement of building. Nor is there much literature upon the subject. Schools, so far as education is concerned—that is to say, so far as regards the school-rooms, class-rooms, and conveniences—have been written about by the architect to that department, and an official paper bearing on the subject is issued by the department. The Association of Medical Officers of Schools have dealt with certain questions of school hygiene as concerning their own responsibilities; but, viewed as a whole, there is very little to assist either the architect or his client in all that concerns the *arrangement* of these institutions, and especially the residental institution of the class.

As a result of this absence of any definite principle in the arrangement of such buildings, we find all sorts of plans are adopted—some good, some indifferent, and some bad—very bad.

We accordingly find colleges and institutions intended as residential places for numbers of young persons reputed to be in good bodily health, though in some instances they may be blind, or deaf and dumb, or of weak intellect, or more or less destitute or deprived of parental care, as orphans, arranged upon all sorts of plans, the residential rooms being arranged sometimes even over the domestic offices, round the four sides of a quadrangle, or in buildings several stories high in the form, on plan, of the letter E or the letter H, and of a size intended to hold hundreds of persons.

The institutions to which I refer, being commonly intended for young persons, have, I think, taught lessons which the architect, among others, would do well to study. Poor law institutions for children have needed, and have received, a very large amount of attention, and have been observed by many experts. The child may be regarded as a sensitive instrument which indicates very promptly and with much precision every variation of the health-conditions in which he is placed; and the experience of the large Poor Law schools is most instructive.

Some thirty or thirty-five years ago the objections to keeping the children in the workhouses, especially in the Metropolis, came to be recognised, and moreover, the space they occupied began to be wanted for adults, and accordingly they were in many cases removed to separate school-buildings, residential of course, on large open sites outside the towns, and arranged on what was considered the best plan. Notwithstanding, however, all the advantages under which these new institutions were placed, the result, after long and often very careful trial, was far from encouraging. Ophthalmia, diseases of the skin and scalp, and other troublesome disorders prevailed in these schools to an extraordinary extent, and in some instances seemed irremediable. Specialists were called in, enormous expense was incurred in medical advice and treatment, but with only partial or temporarily successful results. As regards ophthalmia, Mr. Nettleship, the eminent occulist, who was consulted in regard to all the Metropolitan pauper schools, numbering many thousand children, has asserted that this disease "is the touchstone of the general healthiness of an institution," and he further remarks that "where many persons are herded together, their eyelids show sooner and more certainly than any other part, if the conditions of vigorous health are not complied with." Dr. Mouat, again, who had wide experience in this class of institution, says "the stunted, impaired general health and feeble bodily powers of too many of these children are not removed or corrected by massing them together in large buildings or groups," and he points out that "there is a large and possibly increasing factor of imbecility, idiocy, and nervous disorder generally, and some of the more immediate results of scrofula at the critical periods of life, which may be due to the insanitary conditions" inherent to the aggregation of large numbers of children in huge buildings.

It is this *aggregation* of human beings in vast buildings to which I wish to direct special attention. The evil results, due in a great measure to it, have been particularly noticed in Poor Law institutions, but those same evil results are not by any means unknown in other institutions. Ophthalmia has been found in them, though perhaps in a less aggravated form, and tendency to other disease is commonly experienced in them, but its severity is less, by reason probably of a variety of circumstances, such as the superior condition under which the children in those other institutions are reared before being sent to school, the periodical change the children enjoy in the three usual annual vacations, and so forth. These large institutions, with vast aggregations of children under the one roof and in the one atmosphere, have come to be regarded as a failure on hygienic grounds, and as with hospitals, subdivision of building with comparatively small groups of human beings is recognised as one of the chief means of maintaining a proper standard of health among the occupiers of the institution. So important is this arrangement of building regarded that it was determined a few years ago to cut up the huge main block of the Central London Schools at Hanwell. That building, originally designed to be partly three and partly four stories high, with a length of frontage of some 650 ft., was, under the superintendence of Messrs. Henry Jarvis & Sons, the architects, subdivided into five distinct blocks. Gaps 16 ft. wide, and open from the ground upwards, were cut through the building in four places, so that the number of children accommodated in it was not only reduced, but the children were completely subdivided into comparatively small groups, and the whole arrangement became more assimilated, in principle, to that now commonly adopted in the construction of large hospitals.

This principle of subdivision of the children into small groups is by no means new. In Switzerland, the family system of schools was introduced by Pestalozzi as long ago as about 1760, and the reformatory School at Mettray in Belgium, on a similar system, has been in operation for about fifty years. In England there are several examples of the system which have been in existence for a long period, and the condition of the children in them has been carefully observed and noted. Some fifteen years ago the suitability of the home or cottage system of training and educating the children of the poor was the subject of an investigation by my then colleagues, Dr. Mouat and Captain Bowly, R.E., and their report, which was subsequently published, shows that, while the system was generally adopted with the primary object of securing greater individual attention to the children for purposes of moral training and education, the hygienic advantages were very considerable indeed. And since the date of that report, as indeed before it in several instances (chiefly in South Wales) a considerable number of Poor Law schools on the cottage-home system have been built, and the result, so far as health is concerned, has been highly satisfactory. There are, as may be expected, many varieties of what is known

as the cottage-home arrangement of school. Some would be more correctly described as on the separate block system, since the number of children in each "home" is large, there being in one or two instances as many as fifty children in each house, and in one, the Philanthropic Society's Farm School, near Redhill, even sixty, but the cottages at that institution are scattered over a very large estate of some 300 acres, and the school is a reformatory for boys who are all of an age greater than that of the children in ordinary schools and orphanages. The houses of the London Orphan Asylum at Watford hold fifty children each, as do also the "homes" in a few of the larger Poor Law schools on this system. The houses of the Little Boys' Homes at Farningham hold thirty children each, and so do those of the Birmingham Poor Law Cottage Homes and some others; the Leicester Guardians adopted the excellent plan of building cottages for their pauper children on different scales, some holding sixteen children, some twenty, and some twenty-four children. In South Wales there are several Poor Law schools on this system, where the imitation of the natural family is approached more closely, the number of children in each cottage being only ten or twelve; a plan which obtains also in some excellent charitable institutions of the kind, such as Dr. Barnardo's Village Homes at Ilford, and the Princess Mary's Cottage Homes for Girls at Addlestone, and others. This system of *segregation*, as distinguished from the common one of *aggregation*, is of the utmost hygienic importance where children are concerned. At some cottage home schools a marked improvement in the health of the children has been noticed on their removal to them; thus in Dr. Barnardo's thirty cottages it is reported in 1878, "A great improvement in the general health and appearance of the children has taken place during the last twelvemonths, and this is attributed by the Governor entirely to their removal from the building where they were formerly all housed together to the new cottages." And I am inclined to attach importance to it, not only in the domicile of the children as a whole, but in the individual rooms where they are assembled, in the dormitories, in their day and play rooms, and especially in their school and class rooms. The question of the number of children who may properly be assembled together for several hours in a schoolroom seems to have never been considered in its hygienic aspect, the main point recommended for attention in planning a schoolroom being (to quote from an official document) "to seat the children in the best manner for being taught." Mr. Nettleship, in noticing this tendency to aggregation of unlimited numbers of children in a large school where there was prevalence of ophthalmia observes that hardly any attempt had been made to treat the children otherwise than collectively. In the official document already referred to, it is pointed out generally that the observance of sanitary laws is as important in a school as in a hospital, hence it would seem reasonable to assume that children cannot be aggregated in a school-room with impunity any more than sick persons can safely be aggregated in a hospital ward. The comparatively short space of time at a stretch that children are kept in a school-room may cause the prejudicial effects to be less readily observed than in the case of patients continuously occupying a sick ward for several weeks; but that evil results ensue from massing large numbers together in school-rooms must, I think, be admitted; and those evil results will be demonstrated with more or less rapidity, and will be intensified or diminished, according to a variety of circumstances, such as the general health-condition of the children, the amount of floor-space and cubic-space allotted to each child, and the efficiency of the ventilation and the warming of the room.

In view of these considerations, I look with no small anxiety at the enormous aggregation of children in many of our public elementary schools where they assemble, not only in large numbers in their several school and class rooms, but where those rooms are piled up in several stories, and arranged so that, in many instances, the vitiated air is equally diffused throughout the entire building by means of the staircases and corridors. I cannot but think that in time to come these huge school buildings will be the subject of condemnation on account of their arrangement being found to be defective on hygienic grounds. Already the large increase of diphtheria that has taken place in England since elementary education became compulsory in 1870, is attributed in some measure to the association of children in vast numbers in the public elementary schools, and over and over again it has been ascertained that the village school or the Board School has played the chief part in fostering and encouraging local epidemics.*

Hence if the aggregation of children is a source of evil in those day-schools where the children assemble for a few hours only at a time, how much greater is likely to be the evil from similar aggregation where the children pass the whole twenty-four hours of every day in schools and orphanages of the residential type?

I referred at the commencement of my lecture to the way in which the pavilion system of hospital construction is occasionally abused. That system was introduced mainly, no doubt, to secure improved ventilation in the wards; but it also possessed the advantage of allowing the subdivision of the patients and of the more effectual classification of them, the surgical from the medical, and of grouping them with greater comfort to themselves and with greater efficiency, convenience, and economy of nursing and administration. That the subdivision of the patients in a large hospital is of value as an important factor in the health conditions of the institution will be admitted by everyone who carefully studies the statistics and mortality rates of hospitals. The late Dr. William Farr, of the statistical branch of the Registrar-General's Department, says, "The collection of a number of persons exceeding those of an ordinary family, under one roof, has hitherto had a tendency to increase the dangers of disease; for several diseases are, like fire and ferments, diffusible. The danger is increased when all the patients are sick, for their breath and excretions spread through the wards. The dangers, too, are likely to increase in a faster ratio than the numbers."† I wish to lay special stress upon this assertion of Dr. Farr's that the dangers of aggregation are *likely to increase in a faster ratio than the numbers of patients*. As bearing on the same feature, I may remind you of what is said by Mr. Lawson Tait, the eminent surgeon, where, in his work on "Hospital Mortality," he contends that his statistics prove "that after the number of beds in a hospital exceeds 100, the risk to life becomes so much increased that it is questionable whether any hospital should be of larger size than this. If circumstances make it necessary that the hospital should be larger, most undoubtedly special arrangements and precautions should be taken to obviate the extra risk which is involved."

In view of these grave assertions of men whose experience and position entitle their opinions to much weight, it is indispensable to arrange a pavilion hospital in such a manner that the several pavilions shall be absolutely detached one from another, and so that the wards in every block should not intercommunicate with each other so as practically to have one atmosphere common to all of them, a point of importance, be it remembered, in a cottage hospital (where surgical and medical cases are received for treatment) as well as in other hospitals. This arrangement of complete separation of the several blocks or pavilions of a hospital is well understood by our friends in France, Germany, and some other countries, where the pavilions in certain modern hospitals are placed at a distance apart without any other means of communication with each other and with the administrative offices than an open path or roadway; and moreover, the blocks are often only one story high, and consequently contain only a very restricted number of patients. Now, if we look at the arrangement of our hospitals at home, we find a condition very different from what our foreign friends consider desirable. Which hospital shall we choose for examination? St. Thomas's Hospital is one of our most modern, erected at great cost, in a position where it claims the attention of foreigners, and competes in magnificence with the Palace of Legislature opposite to it. At this hospital we find huge wards piled up one upon another in four stories, with a basement for stores, &c., beneath them, and dormitories for nurses and servants in an attic above them. Not only are these wards intimately connected with each other by spacious staircases from basement to attic, lifts for patients, lifts for coals, food, &c., and shoots for ashes and soiled linen, but, as if there had been a distinct intention to assimilate the air throughout the interior of the whole institution as much as possible and to counteract the effect of the "pavilion" system, the several pavilions, each holding some 112 patients, are connected together by enclosed corridors in the basement story, in the ground story, and in the one-pair story. So, too, at some of our best Poor Law infirmaries, the pavilions are joined together, end to end, instead of being kept separate and merely connected with the staircase by means of a short corridor. These arrangements are directly the reverse of what is aimed at in the best examples of modern hospital construction in France and Germany. At the great Friederichshain Hospital at Berlin and at the Moabit Hospital, also at Berlin, at the Eppendorf Hospital at Hamburg, at the St. Denis Hospital near Paris, and others, the ward blocks are absolutely detached, and at some, as the University Hospital at Heidelberg, the ward blocks are connected by a mere covered way open at the sides. No difficulty whatever is experienced in the administration of these hospitals, consequent upon the distance to be travelled in the open air from the nurses' quarters and kitchen offices to the several ward blocks and the hygienic advantage of complete separation of the patients into small groups is appreciated by the medical staff of those hospitals. This segregation of patients is carried to much greater length in the best modern foreign hospitals than in England, for, as a general rule, the ward-blocks rarely exceed one story in height, and practically are never more than two stories high, while the number of patients under one roof, or in one ward, is much less than is the case in our English and Scotch hospitals. So, too, are the buildings spread over the site, so as to give a far larger area of site per bed than is customary in our own modern hospitals. At the great University Hospital at Halle, in Germany, the arrangement resembles a collection of small hospitals rather than one huge hospital like our own St. Thomas's Hospital.

Another hygienic arrangement common in Continental hospitals is the plan of forming verandahs, balconies, and even detached out-buildings or summer-houses, in which a large proportion of the patients are placed, while still in bed, practically in the open air, by night as well as by day, during some four or five summer months of the year, and I am assured by eminent surgeons and medical men that this arrangement is attended with great benefit to the patients. The plan is growing in England, and has been found in several instances in my own knowledge to be most beneficial. This plan of moving the patients out of the general wards during the summer affords the opportunity for allowing those wards of the hospital to be emptied for purposes of cleansing and sweetening, indeed, an eminent German physician once told me in Berlin of the hygienic value attaching to the arrangements of a hospital admitting of every ward being allowed to "*lie fallow*" for a period every year during which the window-sashes are removed and the interior exposed to wind and weather. This is in accordance with the experience of a fever hospital with which I am associated, where it has been found and recorded that after every time of purifying, whiting and painting the wards, the patients with scarlatina first received into them do better than those received into wards which have not been recently purified.

It is unnecessary for me to deal generally with the question of arrangement of domestic buildings in their hygienic aspect, since the need for ample means of light, access of sunshine and circulation of air about them must be well known to all. But there are one or two points about this class of building to which I must briefly refer. There are plenty of examples of blocks of so-called "Model" dwellings in all our large towns which may be pointed to as "models" of what to avoid. In London we may easily find instances of blocks six and seven stories high directly connected at right-angles, and even at acute angles, so that the sun (even when it does shine) can never reach many of the windows, and so that there is inevitable stagnation of air; or, again, that are arranged in streets—*culs de sac*—only

* Dr. Thorne, in his "Progress of Preventive Medicine" (pp. 42 and 43) records that, in an investigation he made into an outbreak of diphtheria in Essex "the incidence of the disease upon children from three to twelve years old was about 50 per cent. greater upon those known to have attended school than upon the remainder." He also quotes from Mr. Power's report on an outbreak at Pirbright "on four successive occasions while the village school was open, well-marked diphtheria occurred among the scholars . . . and this although the school premises were free from recognisable sanitary defects, and although the school was not, after its first closure, re-opened until the disease had seemed extinct in the parish and careful measures of disinfection had been used." Dr. Thorne further points out that the re-opening of the school appeared on each of the four occasions to be responsible for giving a *serious quality* to the resulting diphtheria; and he adds that there are grounds for believing that the aggregation together of cases of diphtheria and of allied throat affections under circumstances such as those obtaining in elementary schools constitutes one of the conditions under which a form of disease of particular potency for spread and for death may be, so to speak, manufactured.

† "Vital Statistics," p. 423.

28 ft. wide. These errors are common enough, owing to the absence of any sufficient controlling power, and though they are fully recognised by the architect and by the County Council too, they are nevertheless often committed under professional superintendence in order to comply with the client's demands for adequate if not excessive return for outlay.

In many of the earlier built blocks of artisans' dwellings it was common enough to arrange them in such a manner that many families were aggregated together in the one enclosed atmosphere of a building many stories high. These buildings were very disappointing in their wholesomeness, and the evidence given before the Royal Commission on the Housing of the Working Classes, 1884, affords some suggestive information bearing upon this important question of hygiene in its application to the arrangement of buildings, while the density of population, in some instances reaching a rate of about 1,000 to the acre, was shown to be very high. The mortality rate in these huge blocks of artisans' dwellings is commonly higher than it ought to be, when it is borne in mind that the tenants are to a large extent specially selected for their respectability and other good qualities. I do not imply that any system of selection is intentionally adopted by the landlord, but that, in effect, the tenants come to be sifted down, so to speak, to a picked set of respectable families, the average being more steady, sober and reputable than the average of the same class living elsewhere. Notwithstanding this advantage, the difference between the mortality rate in these block dwellings and in the whole Metropolis is often very small, and this, too, even in the rate of infant mortality. Thus, it has been stated that in a population of between 6,000 and 7,000 occupying upwards of a dozen different estates of block dwellings, the general death rate was 15·6 per 1,000, while in the whole metropolis it was 18·5 per 1,000; but in those same dwellings the rate of infant mortality was 140 per 1,000 births, or only six less than in the whole Metropolis, where the rate during the same period was 146 per 1,000 births, a difference, in that most important matter, which is so small as to leave much material for reflection and inquiry.

Closely akin to the subject of block-dwellings is that of common lodging houses, and so called "refuges" for homeless persons. When it is borne in mind how the persons resorting nightly to these dwellings carry disease about and spread it all over the country, it will be admitted that improvement is desirable in the arrangement and other conditions of the buildings they inhabit. It has been noticed over and over again that where extensive works, such as railway construction, water conduit works, canal works, and the like, are in progress, and a large number of navvies have to be temporarily housed, various kinds of disease commonly break out among them, and are often spread from them over very wide areas. Now if we look at the conditions under which these people are usually housed, we shall find them crowded together night after night in large numbers with the scantiest amount possible of space, cubic and superficial. The contractor's navvy is housed in a wooden hut, the lodger in the common lodging house is crowded into an indifferently ventilated dwelling, and the houseless poor seek the shelter afforded either by the charitable or the parochial authorities in such refuges as are available, and there are many, but the hygienic arrangements of them generally leave much to be desired. They often hold some hundreds of lodgers, the dormitories having as many as fifty to seventy or more beds in them, and this in two or more stories. These conditions are obviously not calculated to promote the health of the lodgers, but rather to foster and encourage any latent disease that may exist among them.

In my opinion it is most desirable that the building should be so arranged as to allow the large numbers received into such lodging houses and refuges to be subdivided into small groups, the dormitories being severed as much as possible, aërially, one from another, and the number of lodgers in each reduced to a maximum of some twenty, unless the customary amount of superficial and cubic space to each lodger be largely increased.

It will be gathered from what I have said that great hygienic importance attaches, in my humble opinion, to such arrangement of building as will ensure the segregation of human beings as far as practicable where they have to be collected together for special purposes, and it is because I have been led to this opinion by many years of observation that I venture to urge it as strongly as I do. I have noticed that, even quite recently, competition plans have been, or are to be, invited for large schools—in one case a day-school for some 1,200 children, and in another a residential school for some 700 boys, with an intimation that accommodation will be needed later on for about 500 girls—and so far as I have been able to gather the really important questions of the hygienic arrangement of buildings and of the disposition or grouping of the children for purposes of health, are practically ignored, or are left to be determined on the lines that it has been the custom to follow for very many years, and which I venture to think ought to be regarded as obsolete.

I do not doubt that much may be said in favour of the present system of arrangement—the aggregation system I will call it—on the score of economy, but I am inclined to demur to a good deal that has been urged on this head. Time, however, does not allow of my going into the question of relative cost of the two systems on the present occasion. But I will conclude with the hope that the points I have urged may be helpful to the architect in the advice he may be called upon to give his client as to the best way, from a health point of view, of arranging the building he is commissioned to design.

[Some notes of the discussion which followed will be found on another page.]

THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

NEW OFFICES FOR THE "MORNING POST."

On the occasion of the last of this session's spring visits, the extension to the premises of the *Morning Post* in Wellington-street, Strand, were inspected by a large number of members of the Association, under the guidance of the architect, Mr. H. O. Cresswell, and of Mr. F. T. W. Goldsmith, jun., hon. sec. Mr. Cresswell explained that the visit had been robbed of a part of its interest by a recent disastrous fire at the contractor's shops, which had unfortunately consumed the whole of the hard-wood fittings of the building; these had been entirely completed and only awaited delivery, nevertheless the visit was a most interesting one. As is well known, the site is a commanding one at the corner of Wellington-street and the Strand, and the building can be seen from Waterloo Bridge. The fact that the new portion is only an extension of existing premises has influenced to a great extent the design, and many points which create comment may be attributed in most instances to this cause. The front elevations have been kept plain, with a ground floor story of Portland stone, and the upper portion of red brick and Portland stone dressings. There is evidence of restraint in the treatment which is too often lacking in modern work, and this is distinctly commendable. We should, however, have liked to see somewhat thicker sash bars to the upper windows, and a little more bulk to the balusters of the window openings, the thin-ness of the latter suggesting other material than stone. We gave view, plans, and description of the buildings in the *Builder* for February 18 last, but may say here that each floor is in communication with the old portion. The basement has space for engine, boiler, and machines. The ground floor is devoted to the offices for advertisements, cashier, &c., and this is entered from the corner of the building. There is an open area at the back, and around this two staircases are grouped, with the lavatory arrangements on each floor. The ventilating shaft and smoke shaft also occupy space in the centre of the building, immediately adjacent to the strong room. The first floor is devoted to waiting-room, manager's, editor's, and sub-editor's room, and the upper floors to rooms for leader writers and others. The roof-story is top-lighted for the use of compositors. A further inspection of the old premises brought the visit to a close, and here the various processes used in the printing of a large daily paper were demonstrated by the staff in an interesting manner. The contract for the building has been carried out by Mr. D. Charteris.

THE ENGLISH IRON TRADE.—The English iron market shows little appreciable change on the week. Crude iron continues quiet, with few alterations in price. Finished iron is in poor inquiry, but tinplates maintain fair activity. Steel is in only limited request, and both shipbuilders and engineers report little amelioration in prospects. The coal trade remains quiet.—*Iron*.

INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS:

MIDLAND COUNTIES MEETING AT DUDLEY.

A MIDLAND Counties District meeting of this Association was held at Dudley on Saturday, April 29. It was very well attended. Assembling in the Council Chamber of the Town Hall, the members were received by the Mayor (Mr. G. H. Claughton) and warmly welcomed by him to what was once the capital of the Midlands. Mr. Cartwright (Bury), the President of the Association, having taken the chair, Mr. A. T. Davis, of Shrewsbury, was on the motion of Mr. Lobley (Hanley), seconded by Mr. Godfrey (King's Norton), unanimously re-elected Hon. Sec. for the District.

The visitors then proceeded in brakes to Rowley Regis, to inspect Messrs. Doulton & Co.'s drain-pipe, brick, and terra-cotta works. Here they were received by Mr. James D. Doulton, and by him conducted over the extensive and busy works, which are probably the largest drain-pipe works in the world, from the point of view of production and output. The works were established rather more than forty years ago with twenty men. They now cover thirty acres, and gives employment to about 700 persons. The visitors, after inspecting one or two of Messrs. Doulton's newest specialities, including their new safety adjustable or flexible drain-pipe joint, witnessed the production by machinery of drain-pipes of various sizes, from 4 in. up to 30 in. in diameter. The visitors witnessed the various processes the clay undergoes from its reception until it emerges as a finished product. Eight steam presses are at work, turning out about ten miles of sanitary pipes per week. The rapidity and exactitude with which the pipes are made and handled, and the ingenuity of the machinery and appliances brought into play, excited much interest. The visitors subsequently inspected the drying floors on which the pipes are stored for some time preparatory to firing, and the kilns, two of which were open. They also inspected the terra-cotta moulding shops, the brick-making shops, the brick-kilns (we were informed that the plant is equal to an output of 100,000 bricks per week), the engineering shop, and other departments of the works, and after thanking Mr. Doulton for his kindness they resumed the carriages, and on their way back to Dudley inspected the new Public Baths, the Sewage Catch-Pound, and the new Fire Station. They also alighted to inspect a street at Netherton, in which the whole of the houses (comparatively newly-built) have been more or less completely wrecked through subsidences of the ground caused by mining operations below within the last year or two. These houses (all of brick construction) are picturesquely leaning over, at all sorts of angles out of the perpendicular, and parting company from each other in such a way as to make it a marvel that they stand at all, for very little seems to be done in the way of shoring. Of course, all the houses that are most seriously affected are without occupants, but they are not hoarded in for the protection of passers-by, as houses in such condition would be in London; and some houses which show signs of material subsidence remain occupied. An inspection of the street referred to, as well as of other buildings in Netherton, would probably disturb with nightmare the slumbers of some of the District Surveyors in London, who are sometimes regarded as taking too alarmist a view of cracks or settlements in buildings. It is difficult to account for the fact that the buildings referred to at Netherton do not totally collapse, except on the supposition that they are better built than the average house of suburban London, which would probably not stand the ordeal to which the Netherton houses have been subjected.

Returning to the Town Hall, the President, Mr. Cartwright, took the chair, and Mr. Gammage, the Borough Surveyor of Dudley, read a paper giving a brief outline of the principal points of interest in the borough, so far as they affect the work of the municipal engineer. The borough was incorporated in 1865; it has an area of 3,602 acres, the greater portion of which is mining land. Its population is about 46,000 persons, residing in 9,800 houses. The borough consists of Dudley and the outlying districts of Netherton and Woodside, lying about a mile apart. The town is built on the ridge of the Pennine range, with railway and canal accommodation at the foot of the hill on its north-east and southern sides. It is connected with the London and North-Western Railway and Birmingham and Stafford Railways at Dudley Port,

and with the Great Western Railway, which passes through a portion of the borough. It was made a County Borough when the County Councils were established, and is in the county of Worcester, being insulated in the southern extremity of Staffordshire. It is also a Parliamentary borough, extending into the county of Stafford, and an old market town. Two hundred and fifty years ago it had but 360 houses, with about 1,800 inhabitants, including those at the Castle. In 1831 it had a population of 23,000, which it has doubled in the last sixty years. Its trades, in addition to coal, ironstone, and fireclay mining, include iron and brass manufacture, comprising chains, anchors, anvils, nails, vices, edge-tools, gas and water tubing, bridge girders, boilers, bedsteads, fenders and fire-irons, cast-iron water and gas pipes; also glass and cycles. The borough is rich in ironstone, coal, and limestone, which afford all that is required for smelting purposes. Fireclay and basaltic rock are also found in the borough, so that with good trade the district should be a prosperous one. The forty-two miles of streets and roads in the borough cost on an average about 115*l.* per mile per annum for maintenance, which compares favourably with other towns, when taking into consideration the cartage of heavy material to and from the various works, including the coal for gasworks purposes, as well as the large quantity of materials conveyed through the town to and from the surrounding works outside the borough. Mining operations also materially affect the state of the roads and streets of the outlying districts by occasional subsidences. Dudley is a centre for several districts which contain, within a radius of three miles, another 100,000 inhabitants. Before the year 1870 very little seems to have been done to improve the condition of the borough, but since that time the Corporation has taken every opportunity of making improvements, and has followed very well the lead of other towns with regard to sanitary matters. The death-rate is low and the town healthy. Public baths were erected in 1880-81 at a cost of 10,000*l.*. The sewerage scheme for the town was carried out from 1879-84 at a cost of 59,000*l.*, and it claims to be one of the best in the country. The sewering of Netherton and Woodside districts is now being carried out upon the same lines as that of the other portion of the borough, a joint board having been formed consisting of the Corporation of Dudley, the Local Boards of Rowley Regis, Quarry Bank, and other Sanitary Authorities, for a joint scheme by which the sewage will be conveyed to land at Whittington, adjoining the Stourbridge sewage farm. A library and art gallery was erected in Dudley in 1883-4, at a cost of 7,000*l.*, and contracts for the erection of two branch libraries and other buildings for the outlying districts of Netherton and Woodside have recently been entered into, at a cost of 9,000*l.* The town possesses two small blocks of buildings for smallpox and fever cases. Several old properties have been purchased by the Corporation and removed to improve the various streets and markets of the town. Nearly nineteen miles of footway paving of various materials have been laid, at a cost of 12,184*l.* A new fire station, with stabling attached, has, during the past year, been erected at a cost of 1,600*l.* During the past year, thirty-two acres of land have been purchased and laid out as recreation grounds. Notwithstanding all these improvements and new works, the debt of the town is only about 66,000*l.*, and the town is the lowest-rated in the district. The town has also the use, by the permission of the Earl of Dudley, of the Castle grounds, containing sixty-six acres. The late Earl of Dudley also erected a large fountain in the market-place.

Mr. Gammage afterwards (in the unavoidable absence of the author) read a paper on the Sewerage and Sewerage Disposal Works of the Borough of Dudley, by Mr. E. D. Marten, M.A., Assoc. M.Inst.C.E. We make the following extracts from the paper, which was an excerpt from the "Minutes of Proceedings of the Institution of Civil Engineers," vol. civ. :—

The difficulty of dealing with the sewage question is enhanced in the populous district which overlies the celebrated South Staffordshire ten-yard seam by mining operations. Wherever this coal is worked the surface is more or less affected, and subsides or is "drawn," sometimes gradually, but sometimes with such suddenness as to endanger life. Water-pipes of the ordinary description are frequently fractured by these movements, which often cause considerable leakage at the joints. So much is this the case that the author's father, Mr. Henry John Marten, M.Inst.C.E., many years ago found it necessary to design a special socket to obviate the difficulty. Some of the canals which intersect the district are now carried upon embankments 20 ft. in height, over ground which, within the memory of man, was on a level with their banks. It will readily be understood that these subsidences, which are of everyday occurrence in the Black Country, seriously interfere with the work of the sanitary engineer.

The difficulties are not so formidable in the towns themselves as in the districts which surround them, since in most cases the value of the surface-rights in towns, and the necessity of affording vertical and lateral supports to buildings, make any mining operations thereunder impracticable, and it is generally, but not always, found possible to construct and work a system of internal sewerage. It is mainly in connexion with outfall and intercepting sewers laid outside town limits that the troubles accruing from mining operations are experienced. Whilst, moreover, the mining operations in this district are a standing cause of leaky sewers, they are at the same time emphatically a reason why they should be watertight. The South Staffordshire Mines Drainage Commissioners have spent large sums of money in draining the coalfield and in constructing works to prevent water finding its way into the mines, and they very properly watch with a jealous eye any action which may possibly add to their pumping expenses. All sewers constructed outside the actual town district have to be laid in a thick bed of puddled clay, and sometimes are required also to be of cast-iron.

Sewage-farming within the mining area would be attended with great difficulty, as even if a sufficiency of surface land could be acquired without the vast expense of purchasing the minerals below, anything in the shape of irrigation would be open to suspicion, as likely to send water into the mines, and would probably be opposed by the Mines Drainage authorities on that ground. Precipitation, aided by artificial filtration, is practically the only process available for the central towns of this district, unless the sewage can be conveyed by some means over the intervening mining ground on to the non-mining *terra firma* which surrounds it. Precipitation, however, is also attended with considerable difficulties, because, to enable the necessary works to be constructed, the first requirement is suitable land, the mines and minerals underlying which must be purchased. This adds considerably to the cost, and further difficulties are often experienced on account of the operations of adjoining mine-owners, which have a tendency to "draw" the site and the structures erected upon it.

The municipal borough of Dudley has a population of about 46,000, the town itself containing about 30,000 inhabitants, while the remaining 16,000 are scattered among the mining villages which lie within the borough boundaries. It is situated upon a ridge running nearly north and south, and forming a portion of the watershed of England, the natural drainage of the town being partly into the Severn basin and partly into the Trent basin. Some of the houses stand at an elevation of over 800 ft. above sea-level; and the lowest part of the ridge, where it passes through the town, is 660 ft. above sea-level. The districts to be drained lie on each side of the main hill, extending as far down as 590 ft. above sea-level, so that it is only possible to deal with the whole sewage of the town, at any one point, by means of long lines of intercepting sewers connected by a tunnel about half-a-mile in length through the ridge. To these difficulties, arising from the conformation of the ground on which the town is built, were added those arising from mining operations around it.

In 1876 the Corporation purchased an estate known as the Russell's Hall estate, 70 acres in extent, closely adjoining the western side of the town, and lying at a sufficiently low level to deal with the whole of the sewage from both sides of the ridge.

It was proposed to bring the sewage to this land by means of intercepting sewers traversing both flanks of the hill upon which the town is built, and connected by a tunnel, and to deal with it there by means of a combination of filter-beds and irrigation. The estate consisted entirely of mining-ground, and the scheme was consequently opposed, both by the South Staffordshire Mines Drainage Commissioners, and by the late Earl of Dudley, who was by far the largest ratepayer in the borough, and who was advised that the diversion, as proposed by the Corporation, of storm-water as well as sewage on the land, would injuriously affect his mining operations in its neighbourhood, and the streams passing through his estate, besides being unnecessarily costly and likely to create a nuisance. The author's father, Mr. Henry John Marten, M.Inst.C.E., was consulted, and with the concurrence of Mr. George Taylor, the agent for the surface of the Dudley and Himley estates, prepared an alternative scheme which was laid before the Town Council in a report, on July 25, 1876. This scheme, after a delay occasioned by the necessity of obtaining an Act of Parliament—certain portions of the Earl's settled estates being affected by the covenants entered into with the Corporation—was carried out by Mr. H. J. Marten, assisted by the author, during a period extending from June 25, 1879, to July 30, 1884.

The town has been entirely re-sewered on the separate system, and upon the most modern principles. The gradients are in most cases so steep that practically no artificial flushing is required, and from the same cause a few ventilators carried up the sides of the houses in the higher parts of the town are sufficient, with the aid of the ventilating covers of the manholes, to keep the sewers pure and wholesome. The branch sewers are all stoneware, and the joints are made with tarred yarn and cement. Manholes are placed at every change of line or gradient. Only one case of stoppage has occurred since the system has been in operation; and on an investigation being made as to the cause, it was discovered that a butcher was in the habit of discharging hot fat into the sewer. This was put a stop to, and it has always worked well since. The houses have, to a large extent, been disconnected from the old drains, which are intended to be used henceforth exclusively for surface-water, which they convey to the streams and brooks, eleven in number, forming the natural outlets from the town. Only such storm-water as it is impossible to exclude is allowed to enter the new sewers. The old drains, as is usually the case, were found to be of immense size compared with the work they were constructed to perform, and to have been put in without any attempt at system, and the capital outlay which they represent would probably, if properly applied, have sufficed to put down three or four complete modern systems of internal sewerage for the town.

The sewage, collected as above described, gravitates to an intercepting sewer along each side of the ridge upon which the town is built. These intercepting sewers, whose flattest gradient is 5 ft. per mile, converge upon the Russell's Hall estate, the northern one being for the last ½ mile in a tunnel which is in some places more than 100 ft. below the surface of the ground. The hill through which this tunnel passes has been formed by an upheaval of the Upper Silurian Limestones, which here form an anticlinal, from the summit of which the coal measures have been denuded. No trouble, consequently, was experienced from mining operations in driving the tunnel, though the intercepting sewers themselves suffered greatly from this cause. They had to be laid almost entirely in a thick bed of puddled clay, and as near the surface of the ground as possible, which added seriously to their length, as it was necessary to follow the contour of the land. To show the difficulties which have to be contended with in a mining country, the author may mention that, during the construction of the works, he found one morning that some thirty yards of the new sewer had disappeared bodily into the workings below, leaving nothing to be seen except a deep hole resembling the crater of a volcano. This accident rendered necessary a somewhat costly deviation from the line originally selected.

At Russell's Hall estate, the liquid is first sent through rough strainers capable of removing the heavier solid matters; it is then passed into a small reservoir or storm-water catch-pound, formed partly by excavation and partly by embankment, and capable of holding about 2,500,000 gallons. This storm-water catch-pound is situated upon the upper part of the Russell's Hall estate, and the level of its top water-line is 544 ft. above Ordnance Datum. There is a considerable fall between this and the River Smestow, 4½ miles to the westward, the bed of which is 344 ft. lower. Still going westward, the country rises rapidly for the next mile beyond the river to the summit of a range known as the Black Hills, which is 426 ft. above Ordnance Datum. From this point there is a gradual fall westward for some miles. The sewage, collected as above described into the storm-water catch-pound, is delivered by gravitation through a 13 in. cast-iron main, acting as an inverted siphon, across the valley of the River Smestow, on to the summit of the Black Hills above referred to, near the Whitehouse Farm, in the centre of a considerable area of land belonging to the Earl of Dudley. This 13 in. main is 5½ miles in length, and the *average* fall between the

catch-pound and the point of delivery at Whitehouse Farm is about 21 ft. 6 in. per mile. The pipe follows all the irregularities of the land along which it is laid, with rising gradients in the steeper parts, ranging from 1 in 10 to 1 in 21, the total rise from the bottom of the valley to the Whitehouse Farm being 210 ft. in a length of three-quarters of a mile.

There is an overflow weir at the top-water level in the catch-pound, but the accumulated sewage has never risen so high, even during storms. In ordinary times it passes directly from the sewers into the 13-in. main without rising up in the catch-pound, and although consequently it undergoes no previous "settling," and the only treatment it receives is from the rough strainers before referred to, the scouring power is such that the main is always free from silt.

Means are provided at all depressions of scouring out any deposits which may form, and air-valves are fixed at every summit. In constructing these, care was taken to prevent the possibility of the ball-seats becoming at any time choked with sewage. This was effected by means of a separate connecting-pipe between the bottom of the ball-seat and the main air-valve branch. In all other respects the fittings were the same as for an ordinary water-main. For the first two-and-a-half miles the 13-in. main traverses the mining district to the west of Dudley, but near Himley Hall, one of the seats of the Earl of Dudley, the main fault is crossed, and for the remaining three miles of its course, it is entirely over the Soft Red Rocks and Conglomerates of the Bunter Series of the New Red Sandstone, which also extend beyond it for two miles to the west of the terminus, and for many miles to the north and south. Throughout the last three miles, the main lies entirely upon the property of the Earl of Dudley. It is provided, at convenient intervals, with lateral branches leading to circular brick reception-tanks placed in elevated situations on various parts of the estate. On each of these a sluice-cock is fixed so that sewage may be run into the tank when desired. In order that it may not be discharged high into the air by the pressure in the main, a wrought-iron shield or spreader is fixed over the inflow, so that the liquid impinges against it, and is spread quietly over the floor of the reception-well. Openings leading in several directions and guarded by sluice-boards are provided in the tank, and through these the sewage passes to carriers in any direction. This ramification of distributing-pipes is available over a tract of country (including certain lands to the west of the terminus at the Black Hills) some four or five miles in length, and having an average breadth of two miles, or between 5,000 and 6,000 acres in area.

Although this land is available, and is amply provided with the means for the distribution of the sewage, by far the larger proportion of it serves for the present merely as a reserve, and the most interesting operations are to be observed on a comparatively small area in the neighbourhood of the terminus at Black Hills. Here the sewage is applied intermittently to three farms, with an aggregate of 722 acres, under the control of the Earl of Dudley's principal land agent, Mr. George Taylor. Unlike the greater part of the available land (which is upon the Upper Soft Red Rocks of the Bunter Series, and which is tolerably fertile) these three farms are upon the Conglomerate, and the soil is poor and sandy, so that prior to the construction of the works of the Dudley Corporation this land was a by-word in the neighbourhood for sterility. At first the supply of sewage, as might naturally have been expected, was limited; but as from year to year it has increased, the fertility of the farms has developed in a more than corresponding degree.

This bargain is perhaps unique in the history of sewage disposal. The Earl of Dudley takes the sewage from the Corporation without either paying for it or receiving any payment for doing so. He relieves the Corporation, by an ample indemnity, of all further responsibility in connexion with it, by an agreement which has been ratified by special Act of Parliament. Thus the town of Dudley is rid for ever and entirely of its "sewage question," whilst that portion of the Earl's estates under treatment is considerably improving in value. The bargain has been satisfactory to both the parties to it.

A point upon which sanitary engineers will desire information is as to the nature of the effluent from these farms. Mr. Taylor, on being asked, replied, "We have never seen an effluent. The soil absorbs it all," and it is impossible to detect, either in the River Smestow or any other neighbouring brook course, a trace of the proximity of sewage farming operations. The district is sparsely inhabited, but it has never been suggested that there is any contamination of the few local wells. The sewage operations, whilst a great boon as enhancing agricultural prosperity, are not more of a nuisance than others connected with the manuring of the land which are usually carried on in rural districts.

No precipitation is required. The matter held in suspension, which has been described as the bane of the ordinary sewage-farmer, and which clogs the pores of ordinary soil, is found, when applied in the intermittent and sparing manner adopted in this case, to mix admirably with the sandy soil, the nature of which it is gradually changing. The essential feature of the scheme is that the land available is practically of unlimited area as compared with the volume of the sewage. Finally, there are no working expenses. The Corporation men clean out the strainers at Russell's Hall once a week, and by way of precaution a turncock is sent along the line of the 13-in. main once a month to open and oil every valve. In every other respect the system is self-acting.

The total cost of the works, including the internal sewers, the intercepting sewers, the storm-water catch-pound, and the $5\frac{1}{2}$ miles of 13-in. gravitation main, was about 44,000*l.*, but the purchase of Russell's Hall estate, way-leaves for intercepting sewers, and other extraneous expenses, brought the total up to about 55,000*l.* The cost of the 13-in. main and the necessary valves for scouring purposes, &c. (but exclusive of the distributing fittings), was 16s. 2d. per yard, laid complete. No way-leave had to be paid. The storm-water catch-pound, with the necessary ironwork, brick-work, &c., cost 16s. $1\frac{1}{2}$d. per 1,000 gallons capacity, or including a high unclimbable iron fence which was ultimately found to be necessary, 17s. 11d. per 1,000 gallons. The intercepting and internal sewers, including all manholes, junctions, and other necessary adjuncts, but exclusive of way-leaves, cost 30,422*l.* 5s. 3d., or 1*l.* 0s. 3d. per head of the population served by the sewers. These figures are based on the final certificates. They do not include engineering or clerk of works, for which, and one or two other small matters, about $7\frac{1}{2}$ per cent. should be added, 59,000*l.* was borrowed.

In conclusion, it may be remarked that the Corporation of Dudley claim—and with some reason—that they have a sewerage system which is practically perfect. They enjoy all the advantages of the possession and user of a sewage-farm without any of its liabilities; they are burdened with no perpetual charge in the shape of working expenses; they have an entirely modern system of internal and outfall sewerage which gives complete satisfaction; and they get all this for the moderate expenditure upon works of under 30s. a head of the population. Moreover, the only other interest affected (that of the Earl of Dudley) has largely benefited by the operations. That Dudley has succeeded in wiping off what may be termed the adverse balance resulting from mining difficulties, and from the physical conformation of the town, and in replacing it by the exceedingly substantial asset which has been described, should be an encouragement to municipalities where the sewage question is still unsolved. At the same time it must be admitted that this state of things resulted from three circumstances, all exceptional, namely:—1st. That there was a practically unlimited tract of land eminently suited for the reception of sewage within a few miles of the town. 2nd. That the level of this land was such as to allow of the sewage passing on to any part of it by gravitation. 3rd. That the owner was willing to take the sewage and deal with it thereon upon the terms which have been described.

A brief discussion followed the reading of the paper, in which Mr. Middleton (Walsall), Mr. Eayrs (West Bromwich), and Mr. Davis (Shrewsbury), took part, and a vote of thanks was passed to the authors of the papers.

Subsequently a visit was paid to the interesting remains of Dudley Castle, and to the remarkable limestone caverns in the Castle Hill, which were specially illuminated for the occasion at the cost of the Mayor of Dudley. Mr. Madeley gave an interesting description of the geological characteristics of the place. On emerging from the caverns the visitors were entertained by the Mayor at a late luncheon, and so the day's proceedings terminated.

"ORIENTATION OF CHURCHES."—In our article on this subject last week the extreme angle of sunrise on Ascension Day for latitude fifty-six north has been incorrectly taken from the table as that for fifty-three north. It should read "Ascension Day, in like manner, those from 28° N. to 40°-30 N."

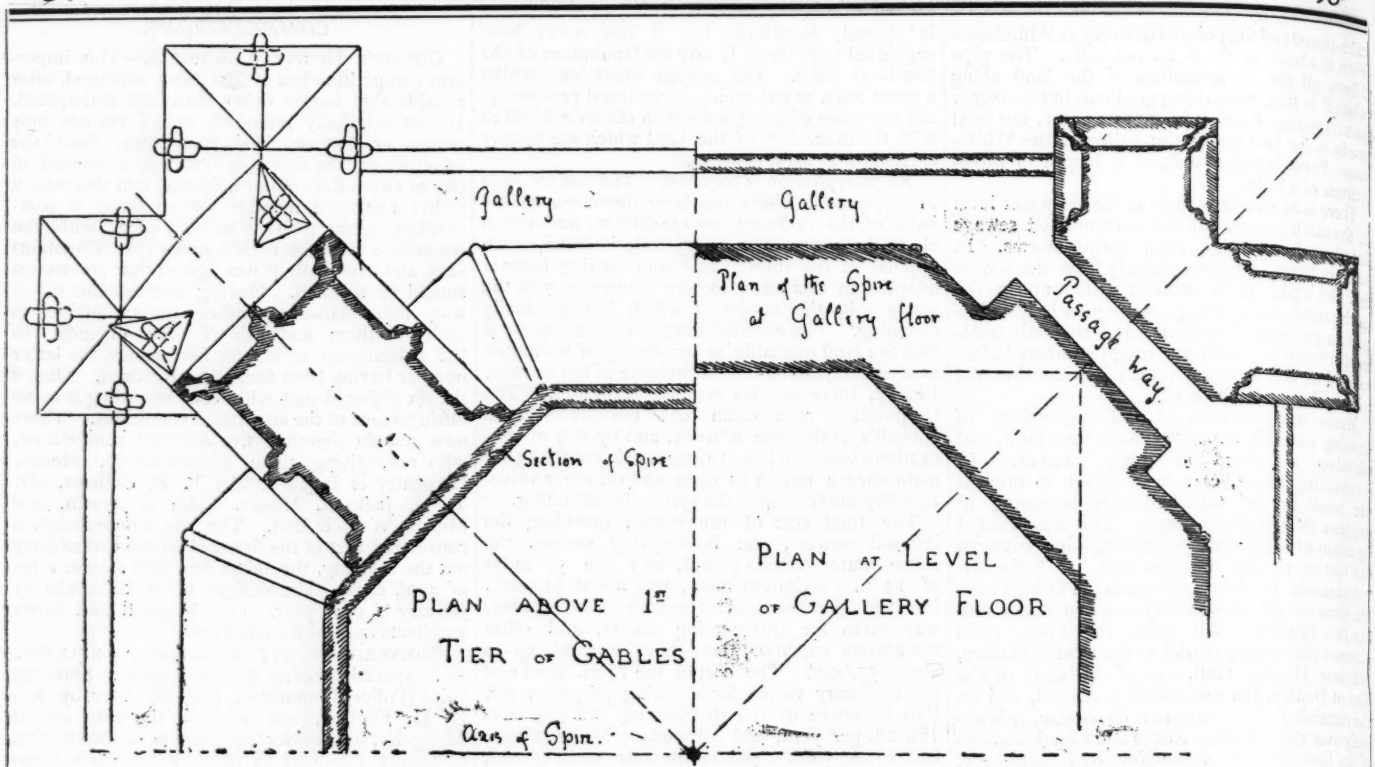
COMPETITIONS.

CHRIST'S HOSPITAL SCHOOLS.—This important competition has at last been arranged, after considerably longer delay than was anticipated. It was originally intended, as our readers may remember, that only four competitors should be selected, but the feeling which was expressed in one or two letters in our columns, that this was a rather restricted number for so large a competition, seems to have had its effect with the committee and with their assessor (Mr. Christian) also, and eventually it was agreed that six names should be selected. Having selected the six, it was then, however, necessary to write to each of them and ask if they objected to the substitution of six for four names, the latter number having been formally advertised. One of the six objected and withdrew, regarding it as an infringement of the advertised conditions. There now remain therefore five selected competitors, who are, giving them alphabetically, Messrs. Carpenter & Ingelow, Mr. T. E. Collcutt, Mr. T. G. Jackson, Messrs. Paley & Austin, and Messrs. Webb & Bell. The one whose design is considered best of the five will be selected to carry out the building, the other four will receive a fee of 400*l.* each. The designs are to be sent in by January 1 next year. One hundred and thirty architects applied for selection.

PROPOSED COUNTY BUILDINGS, ANGLESEY.—A special meeting of the Anglesey Standing Joint (Police) Committee, presided over by Mr. O. H. Foulkes, was held on the 28th ult. at Llangefni, to consider the question of the erection of county buildings in that town. The Committee had some time ago offered a premium of 60*l.* for the best plans of county buildings, and nine sets of plans had been sent in for competition. A sub-committee appointed to consider these plans had decided upon a set bearing the motto of a "Goat," which plans they had accepted, the sucessful competitor proving to be Mr. Lloyd Williams, of Denbigh. At a subsequent meeting of the Police Committee, objection had been raised to the procedure of the sub-committee, it being contended that they had no authority to accept any plans, and a motion in favour of adopting the plans recommended was negatived. The present meeting was therefore convened to reconsider the whole question, and several members objected to the amount proposed to be expended—namely, 6,000*l.* Major R. Ap Hugh Williams, J.P., said that there was a strong feeling in the county that the sum proposed to be expended was much larger than was needed, and that it was mere extravagance. He moved that none of the plans sent in be accepted. Dr. O. Elias Owen, J.P., hoped the committee was not going to stultify its own action in the matter, as the question had been decided once. The plans having been got, the sub-committee had spent a great deal of time to consider them, and had called Mr. O. M. Roberts, of Portmadoc, as assessor. Major T. J. E. Lloyd, J.P., seconded Major Williams's motion. Mr. Lewis Hughes moved an amendment that the plans of Mr. Lloyd Williams, of Denbigh, be accepted, provided the net cost does not exceed £5,000. The Rev. S. A. Fraser seconded the amendment, which was ultimately agreed to.

NEW BOARD SCHOOLS AT MENSTON, YORKS.—We hear that a limited competition for the erection of new Board Schools has been decided by the Board. Mr. Peterson, of Bradford, was called in as professional referee, and on his recommendation the plans submitted by Messrs. Fairbank & Wall, architects, of Otley and Bradford, were accepted, and, at a Board meeting held on the 2nd inst., tracings were ordered to be forwarded to the Education Department. Mr. T. E. Marshall, of Harrogate, was placed second, and Mr. H. Chippendale, of Guiseley, third.

EDINBURGH STREETS AND BUILDINGS ESTIMATES.—On the 29th ult. the Streets and Buildings Committee of the Town Council had before them a provisional estimate for the repair and maintenance of streets, &c., in the year to May 15, 1894. The total estimated expenditure is 50,040*l.*, as against an estimated expenditure in 1892-93 of 49,920*l.*, and an actual expenditure in 1891-92 of 41,295*l.* The receipts next year are estimated at 4,635*l.*; last year these were estimated at 6,805*l.*, while the actual revenue in the preceding year was 1,400*l.* The committee had also submitted to them a draft estimate of expenditure for the formation and maintenance of sewers and drains during next financial year. The total estimate amounts to 21,800*l.*; in 1892-93 the figures were estimated at 20,925*l.*; and in 1891-92 the actual expenditure was 19,110*l.* The revenue for next year is set down at 850*l.*, as against 400*l.* estimated last year, and 652*l.*, the actual receipts in the previous year.—*Scotsman.*



Plan of St. Mary's Tower, Oxford.

Illustrations.

ST. MARY'S CHURCH, OXFORD.

THE splendid steeple of St. Mary's Church at Oxford, which dates from the end of the thirteenth or beginning of the fourteenth century, was repeatedly damaged by storms which destroyed part of the great pinnacles that are grouped round the base of the spire. The upper part of these pinnacles was repaired and remodelled by Vice-Chancellor King in the time of James I., but in a very inartistic manner. The tower in this state is to be seen in Loggan's print of 1675, and it remained unaltered till 1848. At the latter date, the whole steeple, including the tower, was repaired and in a great measure remodelled, and a new form was given to the great pinnacles in substitution for the somewhat bungling contrivance of the Jacobean period. The steeple is shown at the side of the present illustration in the form to which it was brought by the work of 1848-52.

The stone from the Taynton quarries then used was of a perishable nature, and the whole of the masonry of the pinnacles is now in a state of ruin and requires to be reconstructed. Mr. Jackson, whose design we illustrate, proposes to take advantage of this in his reconstruction in order to reduce the excessive height to which the upper part of the pinnacles was raised by Mr. Buckler forty years ago, and to introduce other minor alterations with the object of improving the outline, and bringing it nearer to what was probably the original form. The effect of the alteration will be judged by comparison of the two designs, which are placed side by side in the drawing.

CARLISLE CATHEDRAL.*

THE architectural history of a cathedral church is chiefly to be found in the changes and additions that have been made to the eastern arm, differing in this respect from an ordinary parish church, where the growth of the nave responded to the growth of the parish. Carlisle is no exception to this rule as regards the eastern limb, for the noble choir we now see is the third, if not the fourth, that has occupied the site. The nave also has a history of its own, in that it formed the parish church, and that it has come down to us so shorn of its goodly proportions as to be but a shadow of its former self.

We have little to guide us in the history of this cathedral, beyond tradition and the actual remains of the buildings themselves. We know that in 1092 William Rufus visited Carlisle; that he found it a waste chester, inhabited by a few Celts only; that he set about the erection of a fortress, a *turris fortissima*, on the north of, and abutting on, the site of the ancient Roman town; that he sent Flemish masons and other artificers from a distance to carry out the buildings; and that Walter, a Norman, was in charge of the works.

To this Walter is given the credit of having commenced to build a church at Carlisle, and of intending to found a religious house. The work was taken up by Henry I., who brought settlers from Kent, Essex, Middlesex, to people the town, and, at the intercession of his Queen Matilda, founded and endowed a church and a house of Regular Canons of St. Augustine, in honour of the Blessed Virgin Mary in the year 1101, and appointed as Prior Athelwold, or Adeluph his chaplain, then Prior of St. Oswalds, at Nostell, in Yorkshire, a house of the same order. The same king, in the year 1133, founded the Bishopric of Carlisle, and made Athelwold the first Bishop.

The site selected for this religious house was within the area of the old Roman City, between the new fortress and the site of St. Cuthbert's Church. It possessed all the necessary requirements: water within a few feet of the surface, a frontage to the city boundary, through which they could, and did thereafter, contrive a postern gateway of their own, with access to the rich meadows beyond, a river running almost at the foot of the walls, with possibilities for a mill race, for mills and fish-garths, which they eventually possessed.

The site consisted of a good square plot of ground amounting to nearly five acres, with the road to the castle on one side of it, the city wall on the other, and a narrow lane on its north-west boundary, which afterwards became Paternoster-row. From its western angle, a street ran directly to the west gate of the city, then, perhaps, the most important outlet, opening as it did to the Port of Sandsfield, and the ancient fords. This street, known certainly from the time of Henry VIII., if not earlier, as Abbey-street, is stated by the Rev. Mackenzie Walcot in his "Memorials of Carlisle" to have been called Irish-street, a name which still attaches to the site of the old gate; this gate is marked in old plans as Calidey Gate, from the adjoining river, and still gives its name to the suburb beyond it. The site on its south-west corner abutted on a narrow strip of property extending along the city walls, some half an acre in extent. This property, the then owner of it, Robert de Eglesfield, the founder of Queen's College, Oxford, and chaplain to Phillippa, Queen of Henry III., gave in the fourteenth century to the Priory.

In the latter part of the seventh century Carlisle and the ecclesiastical district round it had been assigned to St. Cuthbert. So that it is probable that a religious house existed at Carlisle long before the twelfth century, but no positive proofs exist of any older building on this site, except two early grave stones, one in the Clearstory wall of the present Norman nave and the other on the south transept.

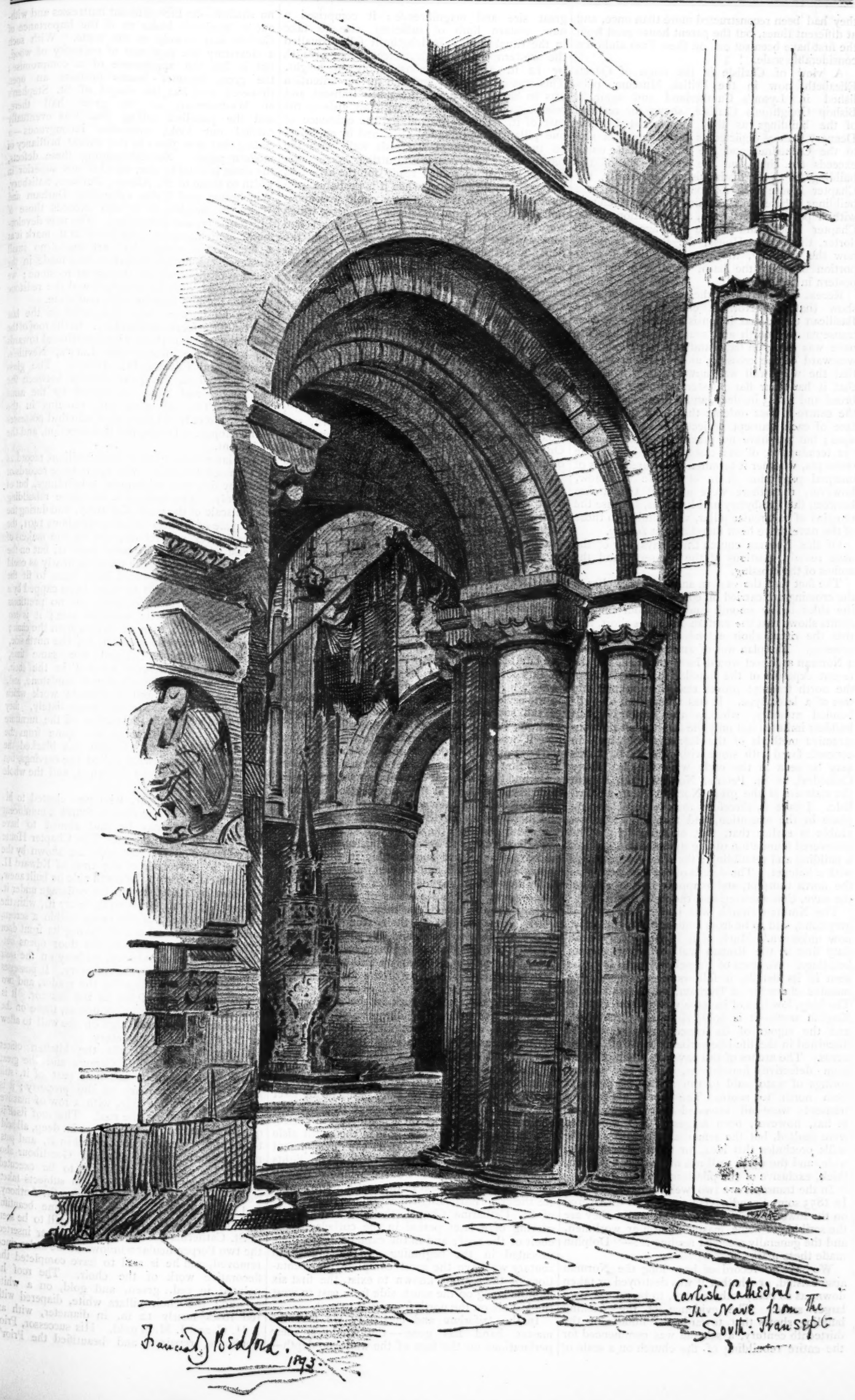
On the site I have described the buildings were laid out with masterly skill. The church was set diagonally across the north-west portion of it, with its main axis almost due east, the west end of the church being set about 33 yds. from the boundary, and thence, as far as the site allowed, the arrangements followed the normal plan. To the south of the nave was the great cloister, about 96 ft. by 90 ft. or thereabouts, round which the buildings appertaining to the monastic life were grouped, and it will be convenient to refer to them now, as they eventually grew to be.

The east side was occupied by the dorter, which abutted on the south transept, and had a doorway and staircase into the church. In the cellarage under the dorter was, next the church, a slype or parlour which gave access to the canon's cemetery to the east. Then came a library or treasury and the vestibule to the Chapter House, which the ruins show to have been an octagon of about 28 ft. across. Beyond the vestibule was the common room, or calefactory, with windows to the south and west, looking into the Infirmary Court, to which a passage on the south side of the cloister gave access.

This south side was occupied by the Frater House, or refectory, with a vaulted basement under it. At the east end was the staircase to the dorter, which still remains, and the passage already referred to as leading to the Infirmary. At the west end of the Frater House was the kitchen court, beyond which the menial offices of the monastery extended: the larders, pantries, wash-house, laundries, brew-house, and stables, with the horreum or great barn at the extreme boundary, a sloping way under the road giving access to a postern in the wall, and to the meadows, mills, and fish-garths beyond. To the west of the church and of the great cloister was the curia, or outer court, with the Prior's Lodgings or Camera, now the Deanery, adjoining the monastic buildings and the gate-house on the further side. The kitchen-court was cut off from the curia by the bridge or covered way which connected the Prior's Lodging with the cloisters, and by the passage under it which connected the Frater House with the kitchen; the doorway leading to this upper passage still exists in the deanery.

I am inclined to think that, on account of the position of the Prior's Lodging, the buildings enclosing the west side of the cloister must have been low and unobtrusive, if more than a wall only as at Alnwick. In that case the buildings devoted to hospitality in addition to the Prior's Camera would probably be placed between the lodge and the gate-house; the remains show that buildings were attached to the gate-house itself, and they would probably be the Almonry or common hall. These buildings were of various dates,

* This series of illustrations of the Cathedrals of England and Wales was begun in our issue of January 3, 1891. A list of those already illustrated, with particulars of future arrangements, will be found on page xxii. We intend to supplement this series with another illustrative of the Cathedrals of Scotland, commencing in the number for July 1. Full particulars will be shortly announced.


Carlisle Cathedral.
The Nave from the
South: Transept
Francis D. Bedford. 1893.

they had been reconstructed more than once, and at different times, but the parent house must from the first have been set out on these lines and on a considerable scale.

A view of Carlisle in the reign of Queen Elizabeth, now in the British Museum, published in Lyson's Cumberland and again in Bishop Creighton's Carlisle, shows the remains of the buildings as they then existed. The Deanery is there depicted as nearly equal in size to the Cathedral, and the Frater House much exceeds the choir, but the general lay of the buildings is easily distinguished, especially the Chapter House with its conical roof. Of these buildings there now remain the great church with a portion of its nave, an indication of the Chapter House and of the cellarage under the dorter, the Frater House, the Prior's Lodging, now the Deanery, the gate-house and a great portion of the tithe barn, together with their postern in the city wall.

Recent discoveries at the east and west ends show that the Norman church was of the Basilican type; that it consisted of a nave, with transepts and north and south aisles; that the nave was of seven bays, and 122 ft. in length to westward of the crossing, and 61 ft. in width; that the west wall was upwards of 7 ft. thick: that it had four flat pilasters, about 6 ft. 6 in. broad and 1 ft. 3 in. deep, and a great doorway in the centre of four orders; that from the eastern face of each transept projected a small circular apse; but we have no precise information as to the termination of the eastern limb beyond the transepts, whether it terminated in three apses of unequal projection or in one. We do know, however, that there were at least two arches between the Presbytery and its aisles, because the remains of a circular pillar, very similar to those of the nave, have been found almost *in situ*.

Of this Norman church three bays only of the nave remain, portions of the transepts, and the arches of the crossing.

The fact that the eastern and western arches of the crossing are carried on corbels so as to leave the sides below smooth and free from impediments shows that the eastern limb was short, and that the ritual choir extended westward of the crossing. The plan was of an early type, such as a Norman architect would have supplied, but the recent exposure of the foundation of the apse of the north transept proves that the workmanship was of a later type. It was throughout of well-bonded masonry, whereas the early Norman builders imitated not only the fashion but the constructive methods of the Romans, and built in concrete faced with stone without bond or tie, as may be seen in the early work at Canterbury Cathedral, at St. Peter's, Northampton, and in the staircase of the great Norman Keep at Carlisle. I take it, therefore, that some delay took place in the execution, and that no work now visible is earlier than that of Athelwold. The uncovered foundation of the apse showed signs of a building and rebuilding; the stones were tooled with a hatchet. The details of the apse return on the north transept, and reappear in the aisles of the nave, thus showing that they are of one date.

The Norman church was built of a beautiful greystone, said to be from a quarry near Rickerby, now unknown. Much of it had probably done duty first in the Roman wall or other Roman buildings. No trace of French influence is to be seen in its details, it follows rather the simple massive character of Durham, on a small scale. The long, low line of its nave was characteristic of English work—it is bold, simple in treatment, and the vigour of its execution may still be discerned in the life-like corbel courses under the eaves. The arches of the nave are much crippled from defective foundations, aided by sundry springs of water said to run across the transept from north to south. The nave, aisles, and transepts were all intended for wooden roofs. It has, however, been suggested that the aisles were vaulted, but the remarkable thinness of the walls precludes this idea, for the aisles are 14 ft. wide, and the north wall not more than 2 ft. 9 in. thick, exclusive of the pilasters.

In the transepts are two wells now walled up. In 1853 some Scandinavian runes were discovered on the lower part of the transept wall; they are the scribble of some master mason or workmen, and the generally received reading is:—"Dolphin made these marks."

We have no record of how long the Norman apse existed, or whether it was destroyed or taken down, as so many others were, to be rebuilt on a larger scale. The evidence of the existing building shows that, towards the middle of the thirteenth century, a scheme was commenced for the entire rebuilding of the church on a scale of great size and magnificence; it comprised a new eastern limb of sufficient size to take in the ritual choir; in length, it fully equalled the western limb, which it exceeded in breadth by 12 ft. and very considerably in height. This was carried out, and the further intention was to have taken down the north transept and rebuilt it on the same scale, with an aisle to the east of it. This is proved by the existence of one pillar of the intended aisle, and by an off-set on the north face of the aisle wall, with the return of the base course and string course upon it, left almost to-day ready for the aisle that never arose, for in 1292, when it is probable from internal evidence that the new choir was about finished, one of those disastrous fires arose which were the scourge of the mediæval towns and totally destroyed the choir, the belfry, and the bells, and thus it happened that for the next hundred years and more, the energies of the canons were devoted to building up the choir anew. Then it was that the great east window arose, which marks a step in advance in art, and is the glory of the building.

The determination with which this work was carried on during the episcopate of at least six bishops seems to show that it was part of a settled plan, supported possibly by the great Chapter of the Austin Canons, which met in the south. The Canons of Carlisle, except at certain intervals, had, after the beginning of the thirteenth century, an independent endowment of their own, and would, therefore, be able to take the initiative. On the Bishop fell the begging, the issuing of briefs and indulgencies, and thus his name would be publicly associated with the work, and when they had for their Bishop a man conversant with their wants, of local knowledge, and of more than local position, they would be able to make progress. Such they had in Walter Malclerk, once a canon of their own church; he held the see for twenty-three years—from 1223 to 1246—he was in high favour with the king, and a leader in political life, and it seems probable that the first great scheme of rebuilding was initiated during his episcopate. Such, again, they had in Bishop Halton from 1292 to 1325, a prelate selected by Edward I. for the most important trusts, of whom it is stated by the late Mr. Hartshorne, "that whatever was done in this fortress (of Carlisle) in the Cathedral, at Rose . . . . or whatever was done in the diocese to the ecclesiastical architecture must be attributed to the superior mind, and energy of John de Halton;" he also had been a canon of the church, and it was during his episcopate that the first thirty years' work of the rebuilding of the choir took place, that the choir was set out on an increased scale, and that the great east window was conceived and erected as high as the springing of the arch. In this rebuilding they added a bay to the choir, and increased its length to a total of 134 ft. 3 in.; the width remained the same, 34 ft. 2 in. between the pillars and 72 ft. across the aisles. The new walls they increased considerably in thickness—the aisle walls to 5 ft. and the east wall to 6 ft. 6 in., indicating a building of greater height than its predecessor. The aisle walls of the thirteenth century they retained, as they had been protected from the fire by their stone roofs; the arches common to them and the choir they also retained, either by rebuilding them on new pillars, or by undersetting, so that we find arches of the thirteenth century on legs of the fourteenth: in the bay they added, they followed the general outline of the earlier work in the aisles: they repeated the beautiful cinquefoiled arcading under the windows, but they applied to it the more advanced detail of the day. The carving and some of the decorative work, even a great part of the mouldings of the east window, they left unwrought, and thus we have a curious interweaving of work — early work with later work below it and later work over it. We find thirteenth century work on a small scale in perfection in the aisles—we can note in the south aisle the gradual step taken towards the development of window tracery in uniting the single lights under one arch, and we see window tracery carried to its perfection in the east window. We see the crisp Early English carving in the corbels of St. Catharine Chapel, the more naturalistic carving of a later period in the corbels to the choir of the roof; and in the capitals of the piers executed in the beginning of the fourteenth century we have the most complete representations of the seasons known to exist, the first six months being on the south side from east to west the last six on the north from west to east.

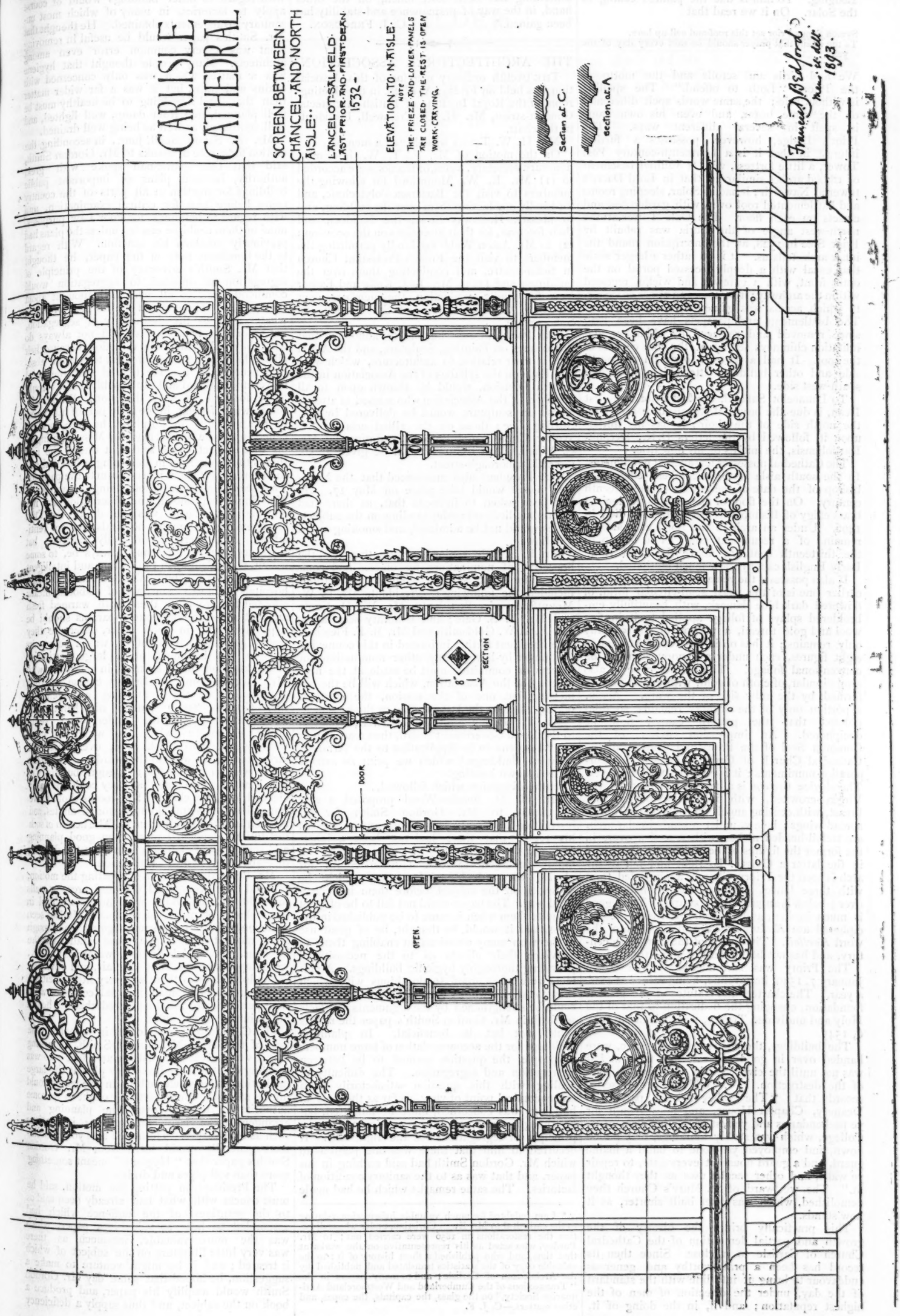
In the triforium and clearstory we find the master hand has gone — the windows, mere perforations on the face of the wall—no depth—no shadow—no life—without buttresses and without a break—it looks as if the importance of Carlisle was already on the wane. With such a clearstory the roof was of necessity of wood, but it has the appearance of a compromise; the great hammer-beams promise an open timbered roof like the chapel of St. Stephen's at Westminster, or the great hall there, and the panelled ceiling that was eventually carried out looks somewhat incongruous—a ceiling that now glows in the utmost brilliancy of modern paint. Notwithstanding these defects, the choir is a noble one, equal if not superior in width to those of St. Albans, Durham, Salisbury, Winchester, and Wells, exceeding Durham and Wells in height, as it also exceeds those of Lincoln, Ely, and Canterbury. The new developments of architecture to be found in it, mark it as a creation in which that art made no small advances. A further departure was made in the erection of this choir in the use of redstone; we find the older quarries deserted, and the redstone used for the first time on any great scale.

The fabric work was completed in the last quarter of the fourteenth century. In the roof of the choir the arms of those who contributed towards the work were placed—the Lucy's, Neville's, Percy's, and Edward III. (king). The glass was inserted in the great window between the years 1380 and 1384, as proved by the arms therein. The old glass still remains in the tracery, the only old glass the Cathedral possesses—the subject, a Doom, the Resurrection, and the Judgment.

The later history has no such brilliant record as that passed through. We again have records of losses by fire, and subsequent rebuildings, but of parts only. The idea of a complete rebuilding on the scale of the choir dies away, and during the episcopate of Bishop Strickland, about 1401, the central tower was rebuilt, not as the makers of the east window would have built it, but on the old piers and scale of the nave, as nearly as could be half the bulk it would have been to fit the new choir. It is said to have been capped by a short spire covered with lead, but no prettiness could ever supply its want of size; it is too narrow, by more than 12 ft., to span the choir; this defect is cleverly screened on the north side, but not overcome. About the same time, the forty-six stalls were erected in the choir. They stand upon a plinth of red sandstone, and, with the canopies and tabernacle work which surmounted them almost immediately, they present an admirable illustration of the furniture of the day. The statues are gone from the niches, and the hand of man has blacked the woodwork and somewhat dulled the carvings, but their vigour can still be discerned, and the whole is rich and effective.

In Prior Gondebour, who was elected to his office about 1484, the church found a munificent supporter. He may be said almost to have rebuilt the monastic offices. The Chapter House and cellarage on the east side are shown by the remains to have been of the time of Edward II. The Frater House on the south side he built anew, as shown by his initials on the cellarage under it. It is a fine room, some 79 ft. by 27 ft., with the usual arrangement of the entry within a screen, and the very unusual one of having its front door turned inside out—that is, the door opens outwards into the ambulatory, midway on the stair of access from there to the refectory. It possesses a charming little gallery for the reader, and two beautiful canopied niches in the interior. It is well lighted by traceried windows, those on the north side being placed high on the wall to allow for the roof of the ambulatory.

Gondebour also rebuilt the kitchen offices abutting on the Prior's Camera and the great barn. This barn, or the best part of it, still stands at the boundary of the property; it is entirely open on one side, with a row of massive oak posts to support the roof. The roof itself is quite a forest of timber, beams 21 in. deep, all held together by pins, without a nail in it, and puts most modern roofs to shame. Gondibour also caused the legendary paintings to be executed on the backs of the stalls, with subjects taken from the history of St. Augustine, St. Anthony, and St. Cuthbert. He added some beautiful screens, the remains of which are still to be seen in St. Catherine's Chapel. He further inserted the two Perpendicular windows in the aisles since removed, and he is said to have completed the decorative work of the choir. The roof he painted in red, green, and gold, on a white ground; the choir pillars white, diapered with red roses nearly 12 in. in diameter, with an I. H. C. and J. M. in gold. His successor, Prior Senhouse, repaired and beautified the Prior's


CARLISLE CATHEDRAL
SCREEN BETWEEN CHANCEL AND NORTH AISLE.
LANCELOT SALKELD LAST PRIOR AND FIRST DEAN 1532 -
ELEVATION TO N AISLE.
NOTE
THE FRIEZE AND LOWER PANELS ARE CLOSED. THE REST IS OPEN WORK CARVING.
Section at C.
Section at A
Francis D Bedford Archt. 1893.
SECTION
DOOR
OPEN.

Lodging. To him is due the painted ceiling of the Solar. On it we read that

Symon Senus Prior set this roof and ceil up here,
To the intent that prayer should be said every day of the year.

We find birds and scrolls and the motto of the Prior, "Loth to offend." The spelling is without rule; the same words spelt differently on the same beam, and even his own name is spelt in several different ways. The Prior's Lodge, however, possesses a further interest in that it is a fourteenth-century Peel Tower, a little fortress, with a vaulted basement of ribbed arches similar to that in Lord Dacre's tower at Naworth; it had its Solar, sleeping rooms and battlemented roof over, with garderobes and closets on each floor. The Gale Tower at the north-west angle of the Curia was rebuilt by Prior Slee in 1528, as the inscription round the inner arch tells us. It is on rather a larger scale than usual with a deeply recessed portal on the outer front, with a gateway and wicket recessed within the archway; it possesses an upper chamber, to which access was gained by a circular stair. The battlements and parapets have been long since removed and replaced by chimneys and imitation chimneys set up at the four corners of the roof. It had a porter's lodge on the north side and other buildings attached to it on the south-west side.

To Launcelot Salkeld, the last Prior and first Dean, is due the beautiful Renaissance screen on the north side of the choir; it has his initials upon it, followed by the letters D.K., Decanus Karlioliensis, the initials of his new title.

The Cathedral possesses few ancient monuments. In the south aisle is the recumbent effigy of a bishop of the date of the middle of the fifteenth century. On the floor of the choir is the incised brass effigy of Bishop Richard Bell, who died in 1496. Under an arch in the north aisle are the remains of a recumbent effigy of a bishop of the thirteenth century; above the head is an Early English canopy, now much mutilated.

It also possesses the remains of two copes. The earlier one is of the usual semi-circular form, of flowered dark blue damask, with beautifully embroidered splays of foliage applied to it in fine wool and gold thread, a portion of the orphray only remains; it has on it the representation of eight figures, each under a canopy standing on conventional foliage. The second cope is also semi-circular, of cloth of gold, with a bold pattern formed by the ruby silk of the warp. Again, a portion only of the orphray remains, so dilapidated that the pattern cannot now be deciphered. An impression exists of the Common Seal of the Priory and Convent of the Cathedral Church of Carlisle amongst the Corporation muniments; it is circular, 2½ in diameter. The device thereon is a half-length figure of the Virgin crowned, with infant Saviour at her breast, with censing angels on each side with outspread wings; below, under a semi-circular arch, are trefoil-headed niches, with a vesica over, in the former the figures of the Bishop and Prior, and in the latter a Cross. To right and left of the arch is seen the Priory Church, a pinnacled front with three lancet windows and a small trefoil over; below is an embattled parapet. The legend is much broken, and the only words to be deciphered are *Ecclesie sancte*, and a portion of the word *Karlioli*. The seal is of the thirteenth century, and has not been heard of since 1660.

The Priory was surrendered to the crown January 7, 1540, its revenue, being valued at 481*l.* a year. The charters and statutes of the present foundation, changing the dedication to that of the Holy and undivided Trinity, were given on June 6, 1545.

The buildings, there is reason to suppose, were handed over in good order at that time, and it was not until the civil wars in 1646 that we hear of the destruction. Dr. Todd in his manuscript records that: "The Abbey cloisters, part of ye Deanery, Chapter House, and houses built for ye prebendaries and ye rest of ye members of ye College, which was stately buildings, they pulled down, and employed ye stone to build a maine guard, and a guard house at every gate, to repair ye walls, and other secular uses as they thought fit." The westward of St. Mary's Church they demolished, which was after built shorter, as it now stands.

This practically brings the history of the growth and partial demolition of the Cathedral Church of Carlisle to a close. Since then its record has been a praiseworthy and generous endeavour to bring it into line with the standard of the day, under the direction of men of the highest reputation; and if, in the doing of it, something has been lost, much, on the other hand, in the way of permanence and stability has been gained.* C. J. FERGUSON.

THE ARCHITECTURAL ASSOCIATION.

THE twelfth ordinary meeting of this Association was held on Friday, April 28, in the Meeting-room of the Royal Institute of British Architects, Conduit-street, Mr. H. O. Cresswell, President, in the chair.

Mr. H. W. Tomes was elected a member.

On the motion of Mr. F. T. W. Goldsmith, honorary secretary, votes of thanks were accorded to (1) Mr. E. W. Mountford for allowing the members to visit the Battersea Polytechnic, and for kindly conducting them over the building, and to Messrs. Holloway Bros., the builders, and their foreman, for their attentions on the occasion; (2) to Mr. Aston Webb for kindly permitting the members to visit the French Protestant Church in Soho-square, and conducting them over the building; and (3) to Mr. J. J. Kelly and Father Vere for kindly conducting the members over the new Catholic Church of St. Patrick, in Soho-square.

The President said he had to announce that the lectures on Painting, Sculpture, and the Allied Arts in their relation to architecture, which were put down on the syllabus of the Association in the Fourth Division, would be thrown open to all members of the Association who wished to attend. Those on sculpture would be delivered by Mr. Stirling Lee; those on the allied arts by Mr. Walter Crane; and those on painting by Mr. C. Whall. The lectures would be given at 56, Great Marlborough-street.

The President also announced that the Members' *Soirée* would take place on May 17. He had been asked to intimate that, as there had been some little misunderstanding on the subject, ladies would not be admitted, and smoking would be allowed.

Mr. E. S. Gale, senior hon. sec., then read the house-list of nominations for officers and committee for next session. These nominations included the following:—President, Mr. E. W. Mountford; vice-Presidents, Mr. W. D. Caröe and Mr. E. S. Gale; and honorary secretaries, Mr. F. T. W. Goldsmith and Mr. B. F. Fletcher. The President further intimated in this connexion that under by-law 31 any other nominations for officers or committee must be made at the next meeting of the Association, which will be the last meeting but one of the session, the elections taking place on the last meeting in the session.

Mr. P. Gordon Smith, F.R.I.B.A., Architect to the Local Government Board, then read a paper on "Hygiene in its Application to the Arrangement of Buildings," which we print *in extenso* under its own heading.

In the discussion which followed,

Mr. H. D. Searles-Wood proposed a vote of thanks to Mr. Gordon Smith for his instructive and valuable paper, and expressed his regret that there had not been a larger audience to listen to it. They were all highly indebted to Mr. Gordon Smith for placing the valuable information which he possessed on the subject before them in such a lucid way. The paper could not fail to be of great value to them when it came to be published in the press, and it would, he thought, be of great use to them on many occasions in enabling them to convince their clients as to the necessity of providing thoroughly hygienic buildings. Architects were often urged to do things with which they could not wholly concur, and if their hands could be strengthened by the arguments and facts set forth in Mr. Gordon Smith's paper the results could not but be beneficial. In planning buildings for the accommodation of large numbers of people, the question seemed to be between aggregation and segregation. The difficulty of dealing with this question satisfactorily from an economical point of view, so far as the cost of buildings was concerned, must be admitted, but he thought there would be no doubt that the principle of segregation was the right one. It occurred to him that there was one point as to which Mr. Gordon Smith had said nothing in his paper, and that was as to the sanitary condition of factories. The same remarks which he had made with regard to other buildings would of course apply to factories, in many of which most unsanitary arrangements obtained. He thought that Mr. Smith's paper would be useful in removing what was a very common error even among architects. Many people thought that hygiene was a matter which was only concerned with drains and traps, but it was a far wider matter than that, and a building to be healthy must be well planned, free from damp, well lighted, and well ventilated, as well as being well drained.

Mr. A. Saxon Snell, junr., in seconding the motion for a vote of thanks to Mr. Gordon Smith, said that that gentleman spoke with great authority, because plans of important public buildings for erection in all parts of the country came before him for critical examination, and with regard to buildings for Poor Law purposes, none of them could be erected unless the plans had previously obtained his sanction. With regard to the dominant note of the paper, he thought that Mr. Smith's advocacy of the principle of segregation as opposed to aggregation would commend itself to all who had thought about the matter. There could be no sort of doubt whatever as to the desirability of segregation, but unfortunately architects could not always do what they could wish in that direction, because their clients had not yet been brought to see the absolute necessity of it. He trusted that the Local Government Board and other public bodies would move forward in that direction. While Mr. Smith was referring, in the early part of his paper, to the mortality in hospitals, he (the speaker) called to mind a remark made by Miss Nightingale on that subject. She said that one of the first things to be observed in designing a hospital was to ensure that it should do no harm to the patients. That seemed a rather curious thing to say, but as Mr. Smith had shown, the observation was not uncalled for. There was no doubt that the arrangements of many hospitals, as to ventilation, &c., were theoretically perfect; but their successful working must always be, to some extent, dependent upon the willing and intelligent co-operation of the staff. We often heard of foreign hospitals and institutions, and of elaborate means adopted for providing them with warmed fresh air, but all such elaborate apparatus should be kept clean and in good order, otherwise they would get foul. His father was a few years ago in the basement of a large institution of the kind on the Continent, in company with Mr. Gordon Smith. In the course of their examination of the ventilating arrangements, Mr. Gordon Smith placed his hand deep down into one of the underground ventilating channels; when he withdrew it it was covered with black mud, over which the air passed on its way to the wards. The great point was for architects to design buildings of that kind in such a way that they could be easily cleaned and kept clean. The rooms should have impervious walls and floors, rounded angles, and all such facilities for cleanliness. The health of such institutions depended more upon good planning and suitability of materials than upon the devising of elaborate systems of ventilation.

Mr. Bernard Dicksee, in supporting the motion, referred to the very small enclosed areas or wells for light and air which were now permitted in large blocks of mansions in flats. He had seen some only about 10 ft. square going up through six or more stories. Upon these small wells the kitchens, servants' bedrooms, waterclosets, &c., were dependent for light and air, and obviously in the lower stories there was very little of either. He regarded such small internal courts or wells with perfect horror, and he feared that the health of the inmates must suffer.

Mr. C. H. Brodie also joined in supporting the vote of thanks to Mr. Gordon Smith, remarking that it was a great pity that the architect who was carrying out the very insanitary plan at the large institution vaguely referred to in the paper could not be named. There certainly ought to be some authoritative control over the planning and arrangement of large semi-private institutions such as orphanages. He hoped that young architects generally would learn from Mr. Gordon Smith's paper that "Hygiene" meant something more than soil-pipes and drains.

The President, in putting the motion, said he must concur with what had already been said as to the scantiness of the audience which had assembled to hear so valuable a paper, which was the more valuable, inasmuch as there was very little literature on the subject of which it treated; and if he might venture to make a suggestion, he hoped that some day Mr. Gordon Smith would amplify his paper, and produce a book on the subject, and thus supply a deficiency

* I am indebted for much valuable information relating to the cathedral to Mr. Ewan Christian, under whose direction the restorations in 1856 were carried out; to Mr. Purday, who acted as his representative on the works at that time, and who published a short history of it; to the valuable copy of the statistics translated and published by the Archdeacon of Carlisle; and to many papers in the "Transactions of the Cumberland and Westmoreland Antiquarian Society," on the glass, the capitals, the copes, and other matters.—C. J. F.

that was very much felt. He quite agreed with Mr. Gordon Smith that in planning buildings for large numbers of people the principle of segregation ought to be followed rather than that of aggregation, although it was not always possible for architects to do what they would wish in that direction. He entirely concurred with what had been said by Mr. Gordon Smith and by one of the speakers as to the unsatisfactory nature, from a sanitary point of view, of the nameless plan which had been referred to. He had often thought that there was one class of buildings which, if they were to be judged by the canons of modern sanitation, would be condemned: he referred to the Oxford and Cambridge Colleges, which, however, they would all be very sorry to interfere with.

The vote of thanks having been carried by acclamation,

Mr. Gordon Smith briefly replied. In the course of his remarks he said he quite agreed with Mr. Searles-Wood that there was necessity for improvement in the hygiene of factories and workshops. As to the suggestion that he should amplify his paper into a book on the subject, he had already attempted to do something in that direction, in conjunction with Mr. Keith Young, in a work on Public Health and Hygiene, published by Churchill. In that work, of which the present paper was virtually a "boiling down," he had touched upon the subject of the hygienic arrangement of factories, places of business, shops, and so on. He concurred in general with what had been said as to elaborate schemes of ventilation, which he thought should be adopted with great caution. With regard to the circulation of air in the quads at Oxford and Cambridge, no one would be more sorry than himself to see those buildings interfered with; but he thought that architects who had to design large buildings of a similar kind might profit by the example afforded them by the river front of Somerset House, in which open colonnades had been provided, greatly, in his opinion, enhancing the appearance of the building, while serving a valuable purpose in the admission of a plentiful supply of air to the quadrangle. He could only wish that that example had been followed when the new Foreign and India Offices were planned.

The meeting then terminated.

ARCHITECTURAL SOCIETIES.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—The seventeenth annual meeting of this Society was held on the 24th ult., Mr. G. B. Bulmer, F.R.I.B.A., President, in the chair. The report, which was read by the Hon. Secretary, Mr. W. Carby Hall, F.R.I.B.A., said that the Society had continued to expand in membership, in the area from which the members were drawn, and in the usefulness of the work done. The Council had agreed with the Leeds Master Builders' Association upon a form of contract agreeable to both parties, but, learning from the Council of the Royal Institute of British Architects that a committee appointed by the Institute were in consultation with the Institute of Builders on the subject, and that it was hoped shortly to issue a form of contract which would be acceptable for use throughout the country, further action in the matter was postponed. The Council had had under consideration the subject of unrestricted bill-posting in Leeds, and after obtaining information on the matter from various Continental centres, a memorial had been presented to the Leeds County Council, in the hope that it would strengthen their hands in dealing with the question in the new Consolidation Bill. A memorial had been sent from the Society to the Council of the Institute concerning the anomaly at present existing in the election of Fellows of the Institute, by which young architects of the age of thirty who had been in practice for seven years could present themselves for election and so evade the examination, which was obligatory upon candidates for the Associateship. A memorial, generally signed by the members, was sent to the Leeds School Board last year with reference to the remuneration for professional services offered in the conditions of a competition for a new Board School. A deputation also waited upon the Board, but the Building Committee could not see their way to deviating from the course already laid down, and a large number of the competitors withdrew from the competition. The Council had under consideration a scheme promulgated by the Institute for the dividing of the United Kingdom into architectural provinces for the promotion of architectural education by the systematic organisation of the various classes upon technical subjects. The Society now numbered 121 members—31 honorary members, 50 members, and 40 Associates, as against a membership of 110 last year.—On the motion of Mr. W. H. Thorp, F.R.I.B.A., seconded by Mr. W. H. Beevers, the report was adopted.—The following gentlemen were elected the officers for the ensuing year:—President, Mr. G. B. Bulmer, F.R.I.B.A.; vice-Presidents, Mr. H. B. Buckley and Mr. J. H. Greves; hon. treasurer, Mr. W. A. Hobson; hon. secretary, Mr. W. Carby Hall, A.R.I.B.A.; hon. librarian, Mr. W. J. Mettam, A.R.I.B.A.; members of Council, Messrs. W. H. Beevers, E. J. Dodgshun, F.R.I.B.A., G. F. Danby, A. Marshall (Otley), C. H. Thornton, W. Watson (Wakefield); auditors, Mr. F. W. Bedford, A.R.I.B.A., and Mr. A. E. Kirk, A.R.I.B.A. The proceedings then terminated.

LIVERPOOL ARCHITECTURAL SOCIETY.—The annual general meeting of this Society was held on Monday evening last, Mr. T. H. Harrison presiding. The annual report showed that the membership had increased from 115 to 125. The Council congratulated the Society on the result of the conference of architects recently held in University College. The original object was to facilitate the mapping out of the country into districts, each with a society at its head, so as to improve architectural education throughout the country. The Council hoped that before the beginning of another session they would have arranged with University College a system of education which would be beneficial to all young architects and students of architecture, and that the classes would be well attended. The financial statement showed a good credit balance. After the adoption of the report and the statement of accounts, the officers were elected as follows:—President, Mr. H. Hartley, F.R.I.B.A.; vice-Presidents, Messrs. A. Culshaw, F.R.I.B.A., and H. W. Keef; hon. librarian, Mr. J. L. Blakey, A.R.I.B.A.; hon. treasurer, Mr. James Dod. The retiring President (Mr. T. H. Harrison), gave an interesting address on climate and its effect on architecture. The President was cordially thanked both for the paper and his appreciated conduct of affairs during the past year.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of this Council was held on Tuesday afternoon at Spring Gardens, the Chairman, Mr. John Hutton, presiding.

Finance and the new Works and Stores Committee.—The Finance Committee presented their usual weekly report, which contained the following paragraph and recommendation:—

"Among the estimates is included the sum of 1,011*l.* 16s. 1d. for timber purchased by the Works and Stores Committee in the open market, beyond the sum of 1,000*l.* which the Council on the 18th April authorised the Committee to spend for that purpose. We have received a notification from the Works and Stores Committee of this outlay, with an intimation that unless the amount is paid by the 4th May a discount of 2½ per cent. will be lost, and we have therefore included the amount, 2,011*l.* 16s. 1d., in the list of proposed payments. These special estimates submitted by the Works and Stores Committee are somewhat irregular, but we must admit that they are payments of an urgent nature, and as it is not expedient to have them of frequent occurrence, we consider it desirable that the Works and Stores Committee should confer with us on the subject, so that if possible we may bring up a recommendation to the Council which will conform to the provisions of the 80th section of the Local Government Act. We therefore recommend—

'That the Works and Stores Committee be instructed to confer with the Finance Committee with a view to devising a code of regulations which, while conforming to the 80th section of the Local Government Act, will provide for the purchases of stores for ready money when urgently necessary.'"

The recommendation was agreed to, and in the Report of the Works and Stores Committee, which was taken at a later stage of the sitting of the Council, it was explained that "in the recent public sales there were found some suitable parcels of dry and other timber wanted for the several works now in hand, and the Committee therefore sanctioned the purchase of the selected lots at a cost of 1,011*l.* 16s. 1d., the prices being in each instance fair and reasonable."

Limit of Height of Buildings.—The consideration of the Special Report of the Building Act Committee on this question (which report we printed *in extenso* last week, p. 326) was again adjourned.

The Palace Theatre of Varieties.—Mr. Fardell, Chairman of the Theatres and Music Halls Committee, in answer to a question put by Mr. Mercer, categorically denied the accuracy of a number of statements recently made by Sir Augustus Harris and Mr. G. A. Sala to the detriment of the Council in regard to this building, late the New English Opera House. It had been stated that the Council had compelled the company now owning the building to expend a sum of 18,900*l.* in alterations. Mr. Fardell said that the alterations required by the Council would not have cost more than 20*l.* He had referred the matter to the Architect, who said that, as a matter of fact, no structural alterations were required by the Council, who, however, had been obliged to call upon the company to alter unauthorised alterations, and hence arose the expense.

After transacting other business, the Council adjourned at seven o'clock.

THE INSTITUTE OF BUILDERS:
ANNUAL DINNER.

THE annual dinner of this Institute was held on Wednesday evening last in the "Marble Salon" of the Grand Hotel, Charing Cross, the President, Mr. F. J. Dove, in the chair. About eighty members and visitors sat down to table.

The usual local toasts having been proposed from the chair and duly honoured,

Mr. H. H. Bartlett proposed "The Navy, Army, and Auxiliary Forces," coupled with the name of Colonel Stanley George Bird, who replied in some brief and well-turned sentences.

The Chairman, in proposing "The Institute of Builders," said that the Institute was a continuation of the Builders' Society, which was established about sixty years ago. The primary objects of the Builders' Society were, firstly, the framing of a satisfactory form of contract—a matter which had again been occupying the attention of the Institute of Builders quite recently. The second object in the formation of the Builders' Society was the promotion of good fellowship in a trade in which competition was then, as now, very great. The third object which the founders of the Builders' Society had in view was the establishment of a society membership in which would be some guarantee to architects and their clients of reliability, integrity, and competence. After an existence of about fifty years it was thought by some of the members of the Builders' Society that the scope of its operations might be somewhat extended, and they consequently took steps to become incorporated under the name of "The Institute of Builders." By being incorporated they had acquired a *locus standi* as the representatives of the builders of London before Parliamentary committees and public bodies, such as the London County Council, which had, as he thought, entered upon a very ill-advised attempt to become their own builders. Of course the master-builders could not wish the Council God-speed with regard to that particular scheme. He had referred to the question of an improved form of contract, in devising which the Council of the Institute of Builders had been for the last three or four years much engaged in consultation with the Council of the Royal Institute of British Architects, and he wished to take the present opportunity of thanking the Council of the Institute of Architects, including Mr. Aston Webb, Mr. Rickman, and Mr. White, the Secretary, for the very courteous and considerate manner in which they had received the suggestions of the Institute of Builders. As a result he believed that they had succeeded in framing a perfectly satisfactory and intelligible form of contract, which was now in the hands of the solicitors of the two Institutes; whether, when it emerged from the hands of the solicitors, it would be quite so intelligible, remained to be seen, but he sincerely trusted that during his year of office the new and improved form of contract would become an accomplished fact, so that they might thenceforth proceed upon lines which should be beneficial, not only to builders and architects, but to their clients, the public.

Mr. J. Howard Colls next proposed "The Architects and Surveyors," coupled with the names of Mr. Aston Webb and Mr. Charles Trollope.

Mr. Aston Webb, in responding to the toast, said it afforded him very great pleasure to be present, for he was strongly of opinion that nothing was more essential to the production of good work than that the architects and builders should be on the best possible terms. Their work was of such a nature that unless there was the most perfect confidence between them it could not possibly go on. The subject of the form of contract had been referred to, but they would, he was sure, all agree with him when he said that the most perfectly-drawn contract in the world would be to a large extent inoperative in the absence of confidence and mutual good-will between architects and builders. It was no doubt necessary to have carefully-worded contracts, but he generally put them away in his safe, and had happily seldom or never found it necessary to withdraw them from their resting place, and he had no doubt that was very largely the experience of the master-builders. He had especially pleasure in being present on that occasion, because he had had the good fortune of knowing the chairman for seven or eight years, and had been associated with him in the carrying out of works of some importance, without the slightest

hitch of any sort occuring, and with great satisfaction to their mutual employers. Mr. Aston Webb, after some interesting remarks, which time and space preclude us from reporting, concluded by expressing the hope that the builders and architects would continue to work harmoniously together, and that their joint efforts would result in producing works of architecture, showing that, whatever else the nineteenth century did, it knew how to build.

Mr. Charles Trollope having replied on behalf of "The Surveyors,"

Mr. Thomas F. Rider, in genial terms, proposed "The President." Mr. Dove having briefly replied, proposed "The Visitors," coupled with the name of Mr. Richard Roberts, L.C.C., who, in replying, made a spirited but temperate defence of the County Council. He urged that that body was very much misunderstood, partly owing to the bald and meagre reports of its proceedings which appeared in the daily papers. He believed that, rightly understood, the interests of the Council, who were the representatives of the public, were identical with the interests of both masters and men in the building trade, and he urged the members of the Institute of Builders not to too hastily judge the Council, but to co-operate with it in the promotion of good and wholesome building.

The proceedings then terminated.

FOUR-INCH *VERSUS* SIX-INCH DRAINS:

APPEAL TO THE LONDON COUNTY COUNCIL.

MR. ERNEST TURNER appealed on April 27 to the London County Council against a requirement of the Fulham Vestry to lay 6-in. drains to thirty small houses in Laundry-road. Each house has one w.c. and two sinks, and in addition the rain-water has to be conveyed from roof, forecourt, and back-yard. Mr. Turner contended that a 4-in. drain to each house would, from a sanitary point of view, be more efficient, and in support of his contention submitted evidence that he had drained many large houses since the year 1884 to the present time with 4-in. pipes, and that the result was more satisfactory than where 6-in. pipes were laid. With respect to the rainfall, the capacity of the pipes very largely exceeded the requirements of any known rainfall. The Appeal Committee, after hearing the arguments on both sides, unanimously decided in favour of 4-in. pipes.

Correspondence.

To the Editor of THE BUILDER.

BIRMINGHAM ASSIZE COURTS COMPETITION, 1871.

SIR,—My attention has been directed to an article in your issue of January 7 ("English Architecture of the last half century") wherein some inaccuracies occur in noticing a design I submitted in competition for Assize Courts and Municipal Buildings at Birmingham in 1871. I wish more particularly to correct the statement that "the Corporation purchased the plan." The Corporation, on the contrary, returned the plans.

It is also stated "the design sent in with it was quite unfinished," as if to account for its not having been premiated. This was not so. The drawings were certainly not elaborated after the manner of some competition drawings, but so far as simple geometrical drawings—elevations and sections—could express it, the design was fully set forth. Besides, the design was given first place by the assessor in the first instance, but subsequently its position was reversed. As I recollect the matter, the assessor submitted to the Corporation a report in which he placed my design first in order of merit, but in a second report, while commending the design very highly, he held it to be disqualified through alleged contravention of the "instructions," and he then awarded the first place to the design of a local architect.

How the assessor was led into the unusual course of revising his report after it had been submitted did not quite appear. W. H. LYNN.

*** We think Mr. Lynn's memory must have deceived him as to the completed state of his drawings. In our review of the competition in the *Builder* of April 1, 1871, we find, "No. 9, as we conclude it to be (there was neither motto nor number attached), is a rather remarkable plan, shown only in a few imperfectly finished drawings. The author intimates that other business stood in the way of his completion of these drawings." There must have been some such intimation on the drawings, as we did not know who their author was, and could not have got it in any other way. In regard to the other question, we believe Mr. Lynn is mistaken in thinking that the assessor (Mr. Waterhouse) revised his decision. It was the committee who revised it themselves. In the *Builder* for September 2, 1871, when we published Mr. Lynn's remarkably fine plan, we also published the assessor's remarks on it, and the two following decisions of the Committee, after considering the assessor's report:—

"1. The design without a motto, and marked No. 9 by your committee, having disregarded the instructions to architects issued by your committee, in breaking the street line, and projecting the building into Congreve-street, cannot enter into the competition for premiums without breach of faith with the other competitors, and is, therefore, excluded from the competition.

* * * * *

5. Agreeing in opinion with Mr. Waterhouse, that the design referred to as No. 9, without a motto, is the most masterly design of the series, and by far the best of the set, your committee recommend that they be authorised to treat with the author thereof for the acquisition of the drawings, so that the council may not lose the benefit of that design when it proceeds to consider the important question of erecting the contemplated buildings."

We presume that this proposal to treat with the author, which we thonght had been carried out, never came to anything.—ED.

SHOULD BRICKLAYERS TILE?

SIR,—Certainly not, if they are so stupid as to bed the tiles in mortar or to nail them to the battens. And all architects who specify such methods should be "sent back to their studies." But there are bricklayers and bricklayers, and architects an architects.

The only places where bedding with mortar is permissible are verges, and against chimnies, dormers, and other vertical walls. Then they should be tilted about ¼ in. A cement-fillet then forms a good finish, and is perfectly weathertight, without any unsightly lead flashing.

A very good method has been lately introduced, where Broseby or other nibbed tiles are used. I refer to 4 in. weatherboarding beneath the tiling. This is nailed to the rafters, the thick edge at top, which answers for the batten on which the tile hangs. This weather-board is now imported ready to hand.

WAT TYLOR.

ORIENTATION OF CHURCHES.

SIR,—The comprehensive table of horizontal angles of sunrise now given to your readers (April 29) must prove of much service to the practical student of orientation. May I be permitted to remark, as two methods of obtaining the required point of sunrise have been referred to, viz., astronomically and by watching for the sun, that in the latter case the sun would appear nearer to the north than in the former, as the effect of refraction is to raise the sun above the horizon, so that when it had risen, speaking astronomically, it would have so far proceeded on its inclined path above the horizon that its centre would appear one diameter higher, and somewhat nearer to the south, than when first seen by an observer on a plain.

With regard to the increasing error of the Julian mode of reckoning, it seems probable that the church founder who may have obtained his line from the shadow of a pole would use the Julian Calendar as he found it, while on the other hand the builder who set out the axis astronomically would probably foresee that the error in the Calendar must be corrected sooner or later, and would consequently, by correcting it, connect a certain day with the sun, for the whole period during which his building might stand, even though the date of its erection in process of time might be forgotten. Is it not, therefore, admissible in investigating this subject to apply either method, with regard to the Calendar, provided, that in giving a result, it is explicitly stated by what means it has been obtained?

The difficulty of ascertaining, in many cases, the name of the original patron saint is by no means a light one, for one writer, Mr. Weaver, in dealing with one county, Somerset, has given lists of sixteen churches in which cases the patron saint had been changed since A.D. 1530, and twenty where the dedication is now unknown. For this reason, and seeing that documentary evidence is frequently conflicting, the testimony of the original founders so unalterably laid down in stone—upon the assumption that a particular day was referred to in setting out the lines of their work—seems to be of the first importance in recovering the original dedication; although there may be much difference of opinion at present as to the precise mode of interpreting their testimony; a difference which, it is hoped, a more extended research may eventually remove.

J. HOUGHTON SPENCER.

Taunton, May 1, 1893.

STABILITY OF PIER OF ARCH.

SIR,—I regret to find that I have made an error in developing the expression for the value of p, in which $\cdot 0177r^2$ should be read instead of $\cdot 177r^2$. This will materially affect the value of p in the examples given, and for $p=3\frac{1}{2}$ read $p=2\frac{3}{4}$. The value of (B) is 385·5, instead of 471·5, which being less than the value of (A), the structure is in a condition of *instability*.

In the second example the value of (B) is 400, and the structure is also *unstable*.

If the height h of the pier is 7 ft. 6 in., we find the value of (A) to be 325, and that of (B) is 371; consequently the structure in this case is in a condition of *stability*. E. W. T.

VIGERS (THE WESTMINSTER PATENT FLOORING COMPANY) *V.* THE ACME WOOD FLOORING COMPANY, LTD.

SIR,—An advertisement appeared in your columns in June, 1890, inserted by the Acme Wood Flooring Company, warning all persons against using the flooring of the Westminster Patent Flooring Company as being an infringement of the patents claimed by the former company. An action for infringement was brought by the Acme Company and afterwards abandoned, and we, subsequently, on behalf of our clients, the Westminster Patent Flooring Company, brought an action against the Acme Company for danages in respect of that advertisement. This action was tried on the 18th inst. before Mr. Justice Graham and a jury, and resulted in a verdict being returned in our client's favour against the Acme Company for 300*l.* damages and costs.

As the publication of the advertisement did our clients considerable injury, may we ask you to insert this letter as a notification that the advertisement in question was totally unwarranted.

WEST, KING, ADAMS & CO.

The Student's Column.

CHEMISTRY.—XVIII.

Symbol, Mg. *Magnesium. Atomic Weight* 24.

MANY compounds of magnesium are found native. The magnesian limestones and "dolomites" have been referred to in a previous paper as carbonates of magnesium and calcium. Steatite, soapstone, talc, asbestos, meerschaum, &c., are all silicates of magnesium, while sulphate of magnesium is known as Epsom salts.

The element magnesium is a silver white metal which, when heated in the air, burns with a dazzling, bluish-white light, forming the oxide magnesia, MgO. The light thus produced being rich in actinic rays is often employed as an artificial light for photography. For the so-called "flash-lights" powdered magnesium is often used, the finely-divided metal being blown through the flame of a spirit-lamp.

Magnesium is prepared by heating magnesium chloride with metallic sodium. Carnalite, a double chloride of magnesium and potassium, which is found at Stassfurt, in Saxony, is often utilised as a source of the metal.

Magnesia, or magnesium oxide, MgO, is usually obtained by subjecting magnesium carbonate to a red heat. It is a soft, white powder which is almost insoluble in water, and is tasteless and infusible. It is known in pharmacy as "calcined magnesia."

Magnesium Carbonate, $MgCO_3$, is found native as a crystallised mineral termed *magnesite*. The *magnesia alba* of pharmacy, which is a mixture of hydrate and carbonate of magnesia, is prepared by adding a solution of magnesium carbonate to a hot solution of magnesium sulphate, and washing the precipitate thus obtained.

Magnesium Hydrate, MgH_2O_2 or $Mg(OH)_2$, is found in the form of a crystallised mineral known as *brucite*.

Magnesium Sulphate, Epsom salts ($MgSO_4+7H_2O$) occurs in a mineral spring at Epsom, and also in other waters. It is also found in the potash mines of Stassfurt. Commercially the salt is sold in the form of colourless crystals possessing a bitter taste.

Magnesium Chloride, $MgCl_2$, is also found in some mineral waters.

Magnesium is precipitated from its solutions in the presence of ammonium hydrate and ammonium chloride by sodium phosphate, as a crystalline ammonia-phosphate, $MgNH_4PO_4+6H_2O$, which, when ignited, leaves a residue having the composition $Mg_2P_2O_7$

Symbol Zn. *Zinc. Atomic Weight* 65.

Metallic zinc is not found native, but is obtained from its ores, zinc blende or Black Jack, which is a sulphide of zinc, and Calamine, a zinc carbonate. Zinc is also sometimes manufactured from the red oxide ZnO, and sometimes from the silicate $ZnSiO_4+H_2O$. Blende is found in considerable quantities in this country, but Calamine is imported principally from Belgium and Spain, while the red oxide occurs in America.

To prepare zinc from Blende or Calamine, the ore is first roasted and thus converted into oxide—

$$ZnCO_3=ZnO+CO_2$$
$$2ZnS+3O_2=2ZnO+2SO_2.$$

This oxide is then mixed with powdered coal or coke and heated in fire-clay retorts. The oxide is thus reduced—

$$ZnO+C=Zn+CO.$$

and the zinc, which is volatilised, distils over and is condensed.

Cast zinc is known in commerce as "spelter." When heated in air, zinc burns with a greenish flame, forming zinc oxide, ZnO. In comparatively dry air, zinc does not oxidise to any appreciable extent, but it becomes coated with a film of oxy-carbonate of zinc upon exposure to water containing carbonic acid. The film is not porous, and protects the metal from further action; hence zinc is much used for coating iron. The iron is first cleansed by pickling it, *i.e.*, dipping it into dilute hydrochloric or sulphuric acid; it is then washed, dried, coated with ammonium chloride, and finally dipped into a bath of molten zinc; the zinc adheres firmly to the iron, which is then said to be "*galvanised.*" Zinc is readily soluble in hydrochloric, nitric, or sulphuric acid, and is attacked by air containing any of these acids. At ordinary temperatures it is brittle, but if pure, becomes malleable and ductile at about 220 deg. F. At higher temperatures, such as 400 deg. F., it again becomes brittle. Commercial zinc usually contains lead and iron, and sometimes cadmium and arsenic as impurities. The total quantity of these impurities should never, however, amount to one per cent.

Zinc oxide, ZnO, when pure, is a *white* powder which changes to yellow when heated, but the native oxide is coloured *red* by the oxides of iron and manganese it contains. It is insoluble in water, but soluble in acids. Oxide of zinc is not blackened by sulphuretted hydrogen, and is therefore sometimes used instead of lead carbonate in white paint. It is prepared by distilling metallic zinc in retorts through which a current of air is passed. The metal volatilises, and combining with the oxygen of the air, is condensed as a fine white powder. It is then placed in canvas bags and pressed.

Griffith's Zinc White is an oxysulphide of zinc, obtained by calcining sulphide of zinc at a cherry red heat, raking it out while hot into cold water, and finally drying and grinding it.

As a rule, the term *zinc white* is used to denote the ordinary oxide obtained by the oxidation of zinc.

Chinese White is prepared by grinding zinc oxide into a cream with a gummy mucilage, obtained from a plant termed tragacanth, or goat's thorn.

Zinc Sulphide, ZnS, is white; consequently if zinc oxide becomes changed to zinc sulphide by sulphuretted hydrogen, the colour is not affected.

Zinc Sulphate ($ZnSO_4+7H_2O$), sometimes termed white vitriol, is a white crystalline substance. In small doses it is sometimes used as an emetic in cases of poisoning.

Zinc Chloride, $ZnCl_2$, is a white deliquescent salt, which may be prepared by dissolving zinc in HCl, and evaporating the solution to dryness. In solution it is used as a disinfecting agent, and is known as Burnett's Fluid. It acts as a true disinfectant in killing germs and fungi, and has also the property of absorbing the offensive gases, such as sulphuretted hydrogen, given off by decaying organic matter. It is often employed for cleaning the surfaces of metals, previous to soldering them.

Zinc Carbonate, $ZnCO_3$, is found native as Calamine.

Symbol Cd. *Cadmium.* *Atomic Weight* 112.

Cadmium much resembles zinc in its properties, and is usually found in small quantities in zinc ores, and in the metallic zinc of commerce. The metal is used in the preparation of Wood's fusible metal, which contains 4 parts by weight of bismuth, 2 of lead, 1 of tin, and 1 of cadmium, forming a hard, white alloy, which fuses at about 142 deg. F. The most important compound of cadmium is the yellow sulphide, CdS, which is obtained by passing sulphuretted hydrogen through an acid solution of a cadmium compound. It is used as a pigment, and is known commercially as "cadmium yellow."

Symbol Fe. *Iron* (*ferrum*). *Atomic weight* 56.

Iron is occasionally found in small quantities in a free state, principally in meteorites, but all the iron used in commerce is obtained from native compounds. The following are the most important of the iron ores:—

Red Hæmatite, or specular iron ore, is an oxide of iron, Fe_2O_3, which is found in many forms, often as kidney-shaped masses possessing a red colour, but sometimes in brilliant black crystals. Red hæmatite is the richest iron ore which occurs in large quantities in Britain. It yields from 50 to 60 per cent. of iron, its chief impurity being silica. It is found in the carboniferous limestone of Cumberland and Lancashire, and in Glamorganshire.

Magnetic Iron Ore, or *Loadstone*, is another oxide of iron, Fe_3O_4, but is not found in sufficiently large quantities in this country for it to form one of our iron-yielding ores. It is found in small quantity in Devonshire, but in Sweden and Norway it occurs in large deposits.

Brown Hæmatite is a hydrated iron oxide $2(Fe_2O_3)3(H_2O)$ which is usually found in brown, fibrous-looking masses. The pure ore contains about 60 per cent. of iron. It is found in the Forest of Dean (Gloucestershire), also in Cumberland, Durham, Devonshire, Northamptonshire, and in many foreign countries.

Spathic Ore, or *Siderite*, is a carbonate of iron, $FeCO_3$, which usually yields about 37 per cent. of iron. It is found in Devonshire, Somersetshire, and Durham.

Clay Ironstone is a very impure iron ore, often resembling clay in appearance. It is a carbonate of iron, containing clay and iron pyrites. It is, however, the ore which is most largely worked in England, because it is found in enormous quantities, and usually occurs in the immediate neighbourhood of coal, and is more easily reduced than many of the richer ores. It sometimes only yields about 20 per cent. of iron. It is found in the coal measures of Shropshire, Derbyshire, Staffordshire, Yorkshire, &c., but the ores vary considerably in value, some yielding only about 20 per cent. of iron, while others yield as much as 40 per cent.

Blackband ironstone is a clay ironstone, containing bituminous matter. It is found in Durham and Staffordshire, and also in Scotland and in North Wales. Its yield of iron varies greatly, that from the Scottish, which is the best, being about 40 per cent. Iron ores which are rich in manganese are often used for the manufacture of Spiegeleisen, a mixture of compounds used for making Bessemer steel.

The following analyses from Thorpe's "Chemical Analysis" will serve as specimen analyses of the various iron ores:—

Analyses of Iron Ores.

—	Magnetic Ore. Dannemora.	Red Hæmatite. Lancashire.	Brown Hæmatite. Dean Forest.	Spathic Ore. Westphalia.	Blackband Ore. Scotland.	Clay Ironstone. Dudley.
Ferric Oxide Fe_2O_3	70·23	94·23	90·05	2·75	2·72	0·40
Ferrous Oxide FeO	29·65	—	—	48·12	40·77	45·86
Manganous Oxide	—	0·23	0·88	0·83	—	0·96
Alumina	—	0·63	0·14	1·63	—	5·86
Lime.....	—	0.05	0·06	1·75	0·90	1·37
Magnesia	—	trace	0·20	2·29	0·72	1·85
Silica	—	4·90	0·92	1·62	10·10	10·88
Carbonic Acid	—	—	—	39·92	26·41	31·02
Phosphoric Acid	—	trace	0·09	0·54	—	0·21
Sulphuric Acid.	—	0·09	} tr'ces	—	—	trace
Iron Pyrites ..	—	0.03		0·22	—	0·10
Water	—	0·56	9·22	0·45	1·00	1·08
Organic matter.	—	—	—	0·39	17·38	0·90
	99·88	100·72	101·56	100·51	100·00	100·49

Iron Pyrites, FeS_2, is a sulphide of iron which is worked principally for the sulphur it yields, being largely used for sulphuric acid manufacture. When clay ironstone or any other form of *carbonate* of iron is the ore employed for manufacturing metallic iron, the ore is first roasted in order to drive off CO_2, and leave the iron as oxide—

$$4(FeCO_3)+O_2=4CO_2+2Fe_2O_3.$$

The ore, after roasting, is left in a more porous condition, thus rendering it more easy to smelt; it is also found that the ore can be broken into small pieces far more readily than before it is burnt.

Smelting of Iron Ores.

The smelting of iron ores is effected in large cylindrical furnaces into which a strong blast of air is passed. If, as is now usually the case, the air before being sent into the furnace is heated (generally to 800 deg. to 900 deg. Fahr., but sometimes to 1,400 deg. Fahr.), the process is called the *hot-blast* process, but if the air is not previously heated, but sent into the furnace at the ordinary atmospheric temperature, the iron obtained from the furnace is termed *cold-blast iron*, and is said to have been produced by the *cold-blast* process. The cold blast is very seldom employed in this country.

The blast furnaces, which are often 60 ft., and sometimes 100 ft., in height, are built of strong firebrick and masonry, and are bound together externally by iron plates. Fig. 14 represents in section a typical blast furnace. The top of the furnace is closed by a door in the shape of an inverted cone (A) suspended in position by a chain or by a lever arm. By lowering this inverted cone the mouth of the furnace is opened and the

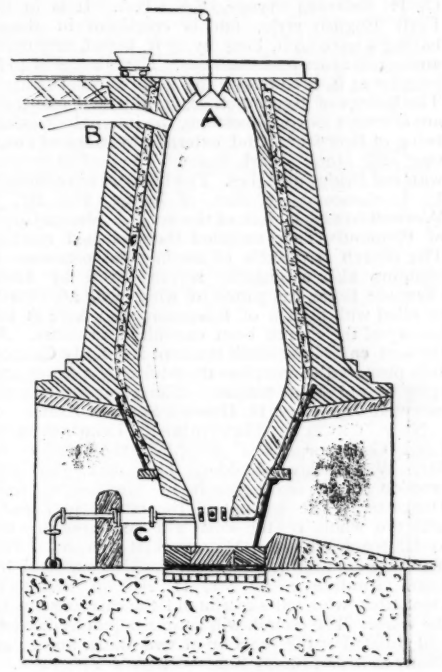


FIG. 14

fuel and ore may be thrown into the furnace. The object of keeping the mouth of the furnace closed is to enable the gases which are generated during the smelting, the principal proportion of which are combustible, to be led away by the tube B at the side of the furnace to be utilised for heating the blast of air which is forced through the pipes, called "twyers" or "tuyeres." C, at the bottom of the furnace under a pressure of several pounds on the square inch. To start a furnace, a charge of coal or coke is first ignited in it, then the iron ore mixed with limestone is introduced, and the blast admitted to the furnace. In this way, alternate layers of coke or coal and iron-ore and limestone are arranged until the furnace is filled.

The hot air passing into the red-hot coal or coke yields its oxygen to the red-hot carbon to form carbon dioxide

$$C+O_2=CO_2$$

which by rising through a further quantity of red-hot carbon is converted into carbon monoxide.

$$CO_2+C=2CO.$$

This carbon monoxide coming in contact with the heated ferric oxide (Fe_2O_3) combines with the oxygen it contains to again form CO_2, and leaves metallic iron in a molten condition.

$$Fe_2O_3+3CO=Fe_2+3CO_2.$$

But this carbon dioxide, rising through the next layer of coke or coal, is again reduced to carbon monoxide, which in turn reduces the layer of ferric oxide above it. In this manner the alternate layers of iron oxide are reduced until, at a certain height in the furnace, a point is reached at which the heat is not sufficiently intense to effect the reduction.

When first produced, the iron is scattered in the form of small beads throughout the clay and other impurities present in the iron ore, and as the clay is infusible at ordinary furnace temperatures it is not possible to collect the whole of the iron formed, unless a *flux*, *i.e.*, a substance which causes the impurities, such as clay and other siliceous matters to melt and form a *slag*, is added. The flux employed is limestone, which is either mixed or arranged in alternate layers with the iron ore.

PRESENTATION.—Mr. Hugh S. Cregeen, Consulting Surveyor to the Bromley Local Board, has been presented by the *employés* of the Board with a silver-mounted walking-stick and silver pencil-case, as a mark of their appreciation of his kindness to them during the time that he was Surveyor.

GENERAL BUILDING NEWS.

NEW CHURCH, BUDLEIGH SALTERTON, DEVONSHIRE.—The new Church of St. Peter's, Budleigh Salterton, was consecrated by the Bishop of Exeter (Dr. Bickersteth), on the 25th ult. The church, the cost of which will be about 8,000*l.*, occupies a site in the centre of the town, and has been erected from a design by Mr. G. H. Fellowes Prynne, F.R.I.B.A. It is in the Early English style, and is cruciform in shape, having a nave 90 ft. long by 27 ft. broad, and north and south aisles and transepts. The chancel is 40 ft. long by 24 ft. broad, with the usual cross passages. The facings of the church externally and internally are of rough Devon limestone, the internal dressings being of Beer stone, and external dressings of Doulting and Monk's Park stone. The roof is covered with red Bridgwater tiles. The builders were Messrs. E. L. Luscombe & Son, of Exeter, and Mr. J. Worwell has been clerk of the works. Messrs Goad, of Plymouth, have supplied the polished marble. The church is capable of seating 800 persons. It contains also a chancel screen given by Lady Gertrude Rolle, the panels of which will afterwards be filled with figures of fishermen who have in the history of the church been canonised as saints. At the east end of the south transept is a Lady Chapel. It is proposed to complete the edifice by a tower and spire of 140 ft. in height. The choir stalls were executed by Messrs. H. Hems & Sons, of Exeter.

NEW CHURCH, HEXTHORPE, DONCASTER.—Lord Grimthorpe has accepted the tender of Mr. W. Anelay, builder, Doncaster, for the erection of a new church at Hexthorpe, near Doncaster. The amount of the tender is 4,560*l.*, and the whole of the cost will be borne by his lordship and his sister, Miss Beckett-Denison. The plans are being prepared, from sketches supplied by Lord Grimthorpe, by Mr, H. Athron, architect, Doncaster, who will superintend the carrying out of the work. The church will be in a populous district, and situated at the junction of two roads, known as Sunny Side and Shady Side.—*Sheffield Telegraph.*

TECHNICAL SCHOOL, ROCHDALE.—The new Technical School at Rochdale, built as a memorial of the Queen's Jubilee, was opened on the 26th ult. by Sir Bernhard Samuelson, M.P. A Higher Grade Board School, erected in close proximity to the Technical School, and with which it is to be more or less connected, was inaugurated at the same time. The Technical School, with its equipment, has cost over 10,000*l.* The building is of red brick, with terra-cotta and stone dressings. Provision is made for the teaching of weaving, cotton-spinning, engineering, practical plumbing and wood turning, chemistry, and dyeing. Messrs. Woodhouse & Willoughby, of Manchester and Stockport, were the architects. The adjoining Higher Grade School has accommodation for 440 pupils. It contains a lecture theatre, a chemical department, and a series of special class-rooms. It has been built at a cost of about 7,000*l.*, from designs by Messrs. Butterworth & Duncan, Rochdale.

CONSERVATIVE CLUB, BLACKLEY, LANCASHIRE.—On the 29th ult. a new Conservative Club was opened at Blackley. The building, situated in Market-street, has cost about 1,600*l.* The land on which it has been erected is about 12 ft. below the level of the street. The whole of the work has been carried out from the designs and under the superintendence of Mr. Everard W. Leeson, architect, of Manchester.

MISSION CHAPEL, ADAMSDOWN, CARDIFF.—On the 26th ult. the Rev. Canon Roberts laid the foundation-stone of St. Elvan's Mission Chapel, Adamsdown-square, Cardiff. The new chapel, the erection of which will entail an expenditure of about 800*l.*, covers an area of 80 ft. by 30 ft., and when completed will seat about 300 people. It is being built of brick, with stone dressings, and will have offices and retiring-rooms attached to it. The builders are Messrs. Cox & Bardo, Cardiff; and the designs for the chapel were prepared by Mr. E. W. M. Corbett.

MINERS' HALL, SILKSWORTH, DURHAM.—The new Miners' Hall at Silksworth, which has just been completed, was opened on the 22nd ult. by Alderman W. H. Patterson. The principal entrance to the building is in Blind Lane-terrace, and consists of an entrance-hall, on either side of which are the committee-room and pay-office. At the west end of the hall, and immediately over the entrance, is the gallery, capable of seating 240 persons. The ground-floor seating accommodation is for 560 persons. Adjoining the hall there is a building two stories in height, containing reading-room (28 ft. by 18 ft.), billiard-room (28 ft. by 18 ft.), and recreation and committee-rooms. In the rear of the reading-room block there are the usual out-offices. The cost of the work has been about 3,100*l.* The works have been carried out from the designs and under the superintendence of Mr. Henry Grieves, architect, South Shields. The contractor for the whole of the work was Mr. T. P. Shaftoe, of Sunderland.

WESLEYAN CHAPEL, EASTRINGTON, YORKSHIRE.—On the 18th ult., foundation-stones of a new Wesleyan chapel were laid at Eastrington, Yorkshire. The designs for the building were prepared by Mr. W. A. Gelder, architect, of Hull, according to which the scheme includes a chapel and class-room, the dimensions of the chapel being 39 ft. by 28 ft. The seats are to be arranged for open stall ends, and there will be sitting accommodation for 120 persons. The contractor is Mr. G. H. Walters, of Hull.

THE BLACKPOOL TOWER.—Messrs. Maxwell & Tuke report that the tower is now erected to 203 ft. 6 in. high, with the exception of a few braces. The riveters are following up the work rapidly, and if all goes well, the tower will be completed within the specified time.

PROPOSED NEW STATION FOR PETERBOROUGH.—The Great Eastern Railway Company, it is stated, will commence the building of a new station at Peterborough shortly. There will be two spacious platforms, 800 ft. long, which will be built on a level with the steps of the carriages. The present booking-offices and adjacent buildings will not be pulled down, as they are said to be roomy and well built. The whole of the surroundings of the station-yard, however, will be greatly improved. The cost of the new station is estimated at 100,000*l.*

ADDITIONS TO COUNTY HOSPITAL, AYR.—Additions to the County Hospital, Ayr, have just been completed. The extensions, which are from plans prepared by Mr. John Murdoch, architect, Ayr, are in keeping with the main building, and consist principally of a sitting-room for the nurses in the general hospital, a servants' hall, nurses' room for the general hospital, and separate accommodation for the nurses in the fever wards. In addition to these extensions, the baths, drainage, &c., have all been remodelled.

WESLEYAN CHURCH, NEAR WHITBY.—On the 27th ult. a new Wesleyan church was open at Thorpe. The foundation-stone of the edifice was laid by Mr. E. W. Beckett, M.P., in the autumn of 1891. The building is of stone, with red tiles. Mr. Waddington, of Manchester, was the architect.

CHANCEL, ST. THOMAS'S CHURCH, LEEDS.—On the 25th ult. the chancel of St. Thomas's Church, Leeds, was consecrated by the Bishop of Ripon. The church, which is in the Decorated style, was built from designs by Mr. W. Butterfield, architect, London, and consists of a lofty nave of five bays, aisles, and south porch. An interval of forty-two years passed away before it was possible to undertake an extension of the building by the erection of a chancel, and plans having been prepared by Mr. Butterfield, these were carried out under the superintendence of Mr. C. R. Chorley, of Messrs. Chorley & Connon, architects. The chancel is about 32 ft. in length and 25 ft. in width, and is faced both inside and out with red pressed bricks, relieved with plain stone strings, corresponding in design with the church. The roof over the chancel is of oak, the buildings being supported on granite and marble shafts built into the walls, and the space between the buildings panelled. The walls of the chancel have a tiled dado, and the choir seats and other fittings are of oak. The east window is of five lights, with moulded jambs and arch of Harehills stone. On the north side there is a stone staircase leading down to the crypt under the chancel, which will serve the purpose of a vestry for the clergy and choir. The crypt is lined with red pressed brick, and the roof is groined or arched in the same material. In the east wall of the present south aisle an arched opening is formed leading into a small cloister, by which communicants can return to the nave of the church. The total cost of the work is expected to be about 1,700*l.*

SCHOOL BUILDINGS, PORT TALBOT, GLAMORGANSHIRE.—On the 24th ult. the corner stone of the intermediate and technical schools at Port Talbot was laid by Miss Talbot, of Margam Abbey. The buildings will be built of a warm red brick, relieved with Bath-stone dressings. In the centre of the building is to be an assembly-hall, divided by a screen, for the use of boys and girls. On the right hand of the assembly-hall will be the boys' class-room, cloak-rooms, and lavatories, with a corresponding accommodation for girls on the left hand side. The building is to be two stories in height, and accommodation will be provided for masters and mistresses, as well as music and cookery rooms, &c. The contractor is Mr. Evan Thomas, Neath, whose contract price for the building was 3,293*l.* 17*s.* 6*d.* The architect is Mr. T. P. Martin, of Swansea; and the clerk of the works is Mr. Evan Roderick, Port Talbot. The school will accommodate eighty boys and sixty girls.

NEW WESLEYAN CHAPEL, BOLTON-ON-DEARNE YORKSHIRE.—On the 13th ult. the foundation-stones of a new Wesleyan Methodist chapel at Bolton-on-Dearne were laid. The cost of the structure will be 725*l.*, and in addition a schoolroom and class-rooms will cost 500*l.* The chapel is to accommodate 250 persons. The architect is Mr. J. Wills, of Derby, and the builder Mr. G. H. Smith, of Mexborough.

FOREIGN AND COLONIAL.

FRANCE.—A rope railway has just been constructed which connects Bas-Meudon, on the bank of the Seine, with the terrace of Bellevue.——The General Council of the Seine will shortly have to occupy itself with an important scheme for the complete sanitation of the numerous communes in the suburbs of Paris. The total cost of the necessary works is estimated at 8,750,000 francs. The Council have also in hand the project for the construction of a new bridge over the Seine, between Neuilly and Puteaux.——The War Department is proceeding to the destruction of the fortifications of the little town of Aire-sur-Lys (Pas-de-Calais).——The following is the result of the competition opened for the re-building of the Hôtel de Prefecture at Troyes. The first premium has been awarded to M. Louis Dauvergne, architect, of Paris; the second is given to M. Masson, of Paris, and M. Brouard, of Troyes, as on an equality; the third to M. Thibaut, of Paris; and an Honourable Mention has been given to M. Gabriel, of Bar-sur-Aube.——The Maison Didron at Paris has in hand some remarkable windows for the decoration of the Church of Notre Dame at Dijon, executed in the style of Louis XIII.—— The monument raised to the memory of Emile Lebon is to be inaugurated at Dieppe in July.——The Minister of Commerce has laid the first stone of the savings bank for the town of Dreux.——The death is announced of M. Eugène Beyer, historical painter, at Nimes, at the age of seventy-nine. He was a pupil of Guérin and of Paul Delaroche. Among his works may be mentioned "La Persecution des Juifs à Strasbourg Pendant la Peste de 1349" (Salon of 1857), and "Une Famille Protestante célébrant son culte en cachette en 1685" (Salon of 1865). M. Beyer was deputy for Strasbourg in the Constitutional Assembly of 1848. He died, it is melancholy to add, in absolute poverty.——We hear also of the death of M. Camille Ruphy, Departmental Architect of Annecy, "Architecte de bâtiments civils" to the State, and President of the Société des Architectes of Dauphiny and Savoy. M. Ruphy died at Annecy at the age of seventy-four.——M. Trian, architect, of Paris, has obtained the first premium in the competition opened by the town of Neuilly-sur-Marne for the construction of a group of schools. The second premium was awarded to M. Lequeux, of Rouen, and the third to M. Pierre Bonis, of Paris.

MISCELLANEOUS.

A NEW MORTISING MACHINE.—A new chain cutter mortising machine, known as the "Star," has been introduced recently by Messrs. Hall & Parry, of the Rosebery-avenue Engineering Works, Vine-street, E.C. As indicated by the name, the cutters are arranged in the form of a chain, which is made to traverse over the wheel at the upper end, and descends into the slot cut in the wood, as the material is removed. It is claimed that a great saving of time and labour is obtained by this arrangement. The mortice is cut through in one operation, without turning over the wood, or splitting it on the under side, and the core is thrown out by the revolving cutters. Hard wood can be mortised without preliminary boring, so that neither a boring apparatus nor a core-driver a rerequired. A notable feature is the absence of vibration in working; an advantage that will be readily appreciated, and one, moreover, which leads to the additional benefits of a machine not requiring any special foundation. Wedge-shaped mortices can be cut in one operation as quickly as parallel mortices, and that without canting the table. The machine can also be used for grooving. The table is operated by a foot-lever, to bring the work up to the cutters, and is adjusted to suit the depth of the wood by means of a screw underneath. The cutter-chain may be taken out and replaced by another of different width in a very short space of time. The machine will cut mortices across the grain, and also with grain, from ¼ in. upwards.

THE BRITISH PRODUCTION OF FINISHED IRON.—The statistics issued last week by the British Iron Trade Association, although in part still incomplete, show a serious falling-off in the output of manufactured iron last year. There were produced 1,560,697 tons of puddled bar against 1,733,902 tons in 1891. This shows a decline for 1892 of 173,205 tons, or 10 per cent. The decrease wa heaviest in Cleveland (113,633 tons, or over 32 pe cent.), due, for the most part, to the stoppage caused by the Durham miners' strike, but also partly to the gradual substitution of steel for finished iron. In all other districts but two the production also fell off, although to not such an alarming degree. The two exceptions were Shropshire and Lancashire, where the output increased by 26 and 0·6 per cent. respectively. So far as can be judged from the partial returns received, the heaviest output of finished products (bars, plates, and sheets, hoops, angles, &c.) was, in Lancashire (264,473 tons); the lowest in South Wales (24,389 tons). Cleveland produced 226,752 tons; Scotland, 151,206 tons; South and West Yorkshire, 104,619 tons. The largest production of finished iron bars is recorded for Lancashire (118,896 tons); of ship plates, Cleveland (129,797 tons); of wire rods, Lancashire (57,598 tons); of hoops, Lancashire (44,945 tons); of sheets, Lancashire (26,252 tons). The latter district thus seems to have suffered least during last year's depression.

THE PRESERVATION OF AMERICAN FORESTS.—It is gratifying to observe that many State Legislatures of the United States are at length endeavouring to arrest the process of forest spoliation which has been going on unchecked for many years. The prairie States were among the first to advocate arboriculture, trying not so much to preserve as to restore and rehabilitate. The general Government interposed seasonably to save the magnificent red-

wood trees (*Sequoia gigantea*) of the Yosemite region and Yellowstone Park in Wyoming, but it remained for the several States, each within its own jurisdiction, to supplement the work initiated in the national domain. New Hampshire has taken action with respect to the White Mountains to hold in check the hands of speculators. The new law in that State, like the present law in Massachusetts, authorises the State to take and protect the gifts of land which are made by its own citizens or by the people of other States, and to construct roads or paths over these domains, but forbids that they should ever again be used for private purposes. Thus the threatened destruction of forests is arrested. In like manner the Legislature of New York, in passing the Adirondack Park Bill, establishes a reservation which ensures its protection by placing the entire region under the control of a forest commission invested with adequate authority. The tract covers at present about 500,000 acres of forest land lying in six contiguous counties, including the islands in Lake George, and provision is made for future enlargement. Maine is also awakening to the need for the preservation of the forests in the Androscoggin region, while a Bill is before the Pennsylvania Legislature to stop the denudation of the forest area within that State.

ARCHITECTURAL ASSOCIATION: DISCUSSION SECTION.—The twelfth and last meeting of the Session was held at 56, Great Marlbro'-street on Wednesday evening, the 3rd inst., at 7 p.m. Mr. W. Henry White presided, and Mr. S. B. Beale, Chairman of the Section, read a paper on "Architectural Drawing and Draughtsmanship." The paper dealt very thoroughly with drawings and draughtsmen of the present day, and was illustrated with a large and carefully-selected series of typical illustrations. The author specially pleaded for an architectural rendering of architectural drawings, and deprecated the introduction of sketching fashions into serious professional work. The following gentlemen were elected as officers for next Session:—Chairman, Mr. C. H. Brodie; Vice-Chairman, Mr. W. Henry White; Hon. Secretaries, Mr. H. A. Satchell and Mr. W. Pywell. The meeting terminated with a cordial vote of thanks to Mr. S. B. Beale for his services to the Section on his retirement from the chairmanship.

THE SOCIETY OF ENGINEERS.—At a meeting of the Society of Engineers, held at the Town Hall, Westminster, on Monday evening last, Mr. W. A. McIntosh Valon, J.P. (President), in the chair, a paper by Mr. Edmund Burrows on Blake's Bridge, Reading, was read. This bridge crosses the river Kennett, and unites the north and south sides of the borough. The old bridge was erected in 1855, with a carriage road only 14 ft. wide. Proving too narrow for the increase of traffic, it has been removed, and a new bridge, 30 ft. wide, has been erected by the Corporation in its place. The new bridge of 51 ft. 4 in. span was designed by Mr. A. T. Walmisley, M.Inst.C.E., and consists of lattice girders 4 ft. 6 in. deep, having parallel flanges with ornamental cast-iron work between the diagonal members, so fixed as to provide a parapet without interfering with the definite transmission of strain throughout the braced members of the structure, which is constructed of mild steel. With the view of distributing the live load produced by a steam roller of 15 tons, together with a distributed weight over the remainder of the platform estimated at 1 cwt. per foot, super., trough flooring 5 in. deep is used, having the lines of ridge and furrow fixed at right angles to transverse lattice girders 4 ft. 6 in. apart, suspended from the main girders, but stiffened in their attachments at the ends by side brackets. The girder form of construction was adopted as providing uniform headway under the bridge, while the original level of the approaches and roadway over the bridge was not raised. With the view of employing the abutment walls of the old bridge, the new girders were carried on brick piers supported by pile foundations, and surmounted with ornamental masonry caps. The upper flange of each of the main girders is covered with American oak to form a hand-rail. The bridge was tested after completion by loading with water-vans, a 10-ton steam roller, and loaded stone trolleys, in all amounting to a total load of 63¾ tons distributed, and gave a deflection in the centre of $\frac{3}{16}$ inch. The bridge was opened for public traffic on October 6, 1892. During construction, vehicular traffic was only impeded for about two and a half months. Messrs. Parker & Co. were the contractors for the foundations and masonry, and Messrs. Handyside & Co., of Derby, for the erection of the steel and iron work. The total cost of the bridge and improved approaches was 4,500*l.* The author acted as Resident Engineer for the Reading Corporation during the construction of the bridge.

CAPITAL AND LABOUR.

STRIKE IN THE BRIGHTON BUILDING TRADE.—On the 1st inst. 400 men came out on strike at Brighton, owing to the employers' refusal to advance the wages ½d per hour and accept the rules regulating hours and overtime.

LEEDS PLASTERERS AND THEIR WAGES.—The journeymen plasterers of Leeds had, about eight years ago, their wages reduced from 9d. to 8d. per hour. Some time ago a movement was initiated by the men with the view of improving their position, and the outcome of several meetings was a decision to serve a six months' notice upon the masters for the purpose of regaining the 1d. taken off. The employers, however, have not seen their way to grant the full demand, but have agreed to concede an advance of ½d. per hour, a concession which, it is understood, the men are prepared to accept. It is reckoned that there are between 200 and 300 plasterers in the city who will benefit from the increase. At the present time the building trade is prosperous, and consequently the plasterers, as in other departments of the building trade, are very busy.—*Leeds Mercury.*

THE CARDIFF BUILDING STRIKE.—A specially-convened meeting of the Cardiff operative masons—the only section of the men affected by the dispute in the Cardiff building trades who have not yet resumed work—was held on Monday night in the Gladstone Hall, Cardiff, to receive the report of Messrs. Huffer and Harvey—the deputation sent down from the men's executive in London—to inquire into the position of the men and the reasons they allege for continuing the struggle. A report was presented favourable to the men, and a gift of 400*l.* was announced from the central organisation to strengthen the position of the men and help them to maintain it in the future.

MEETINGS.

FRIDAY, MAY 5.

Junior Engineering Society.—Mr. A. H. Bromly on "Gold Mining Machinery." 8 p.m.

SATURDAY, MAY 6.

Incorporated Association of Municipal and County Engineers.—Lancashire and Cheshire District Meeting, to be held at Manchester.

Edinburgh Architectural Association. — Visit to Nunraw.

MONDAY, MAY 8.

Surveyors' Institution.—Discussion on Mr. R. F. Grantham's paper on "Recent Experience in Sewage Filtration considered in Relation to River Pollution." 8 p.m.

Society of Arts (Cantor Lectures).—Mr. C. Harrison Townsend on "Mosaic: its History and Practice." I. 8 p.m.

Clerks of Works' Association (Carpenters' Hall).—Paper by Mr. E. Moore. 8 p.m.

TUESDAY, MAY 9.

Society of Arts (Applied Art Section). — Professor W. M. Flinders Petrie on "Primitive Art in Egypt." 8 p.m.

WEDNESDAY, MAY 10.

Society of Arts.—Mr. J.B. Hilditch on "The Richmond Lock and Tidal Weir." 8 p.m.

Society of Biblical Archæology.—4.30 p.m.

Liverpool Engineering Society.—Annual General Meeting. Adjourned discussion on Mr. Ernest W. Pierce's paper on "Engineering Contracts." 8 p.m.

Edinburgh Architectural Association.—Annual Meeting. Valedictory address by the President, Mr. W. W. Robertson. 8 p.m.

THURSDAY, MAY 11.

Society for the Encouragement of the Fine Arts.—Mr. John Leighton, F.S.A., on "Pictorial Advertising—its Use and its Abuse Demonstrated." 8 p.m.

Institution of Electrical Engineers.—Mr. W. B. Sayers on "The Prevention of Sparking, Compound Dynamos without Series Coils or Magnets; and Self-exciting Dynamos and Motors without Winding upon Field Magnets." 8 p.m.

FRIDAY, MAY 12.

Architectural Association.—Mr. E. Guy Dawber on "The Stone Buildings of the Cotswolds." 7.30 p.m.

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

9,616.—DRAIN PIPES: *H. German.*—This patent refers to an improved support for drain and other pipes during the process of laying and fixing, at the same time forming a permanent support after the joints have been fixed. It consists in forming a support of earthenware or other suitable material having a flat base to the ground, the top of the support being hollowed out to receive the pipe. These blocks being only fixed at certain intervals there is access to the pipes all round, ensuring the making of a perfectly sound and air-tight joint, without the necessity of excavation.

8,477.—KILNS: *X. Charles.*—This invention relates to a kiln or drying apparatus. In the middle of a square or rectangular structure of brickwork or masonry is a fire with an ashpit underneath. From the fire rises a flue tapering as it ascends, the flue-pipes branching off at angles. These pipes are provided at the top with deflecting caps, and also with dampers by which their upper ends may be closed, whilst branches from them leading to a central chimney remain open. There are also passages for entrance of air to the interior of the structure, and to flues enclosing the central fire-flue. The parts described are all floored over by a metal plate, which may be perforated, and through which the central chimney passes, and hot-air tubes also pass, when desired, to drying chambers which may be erected above. When the material dried upon the floor is not liable to be damaged, the products of combustion as well as the heated air may ascend through the floor, but if the material is likely to be injured by the combustion gases, the flues for these are closed, the hot air only being allowed to pass.

19,814.—CEMENT BLOCKS: *O. Böklen.*—This invention has for its object the building of single or double walls of solid or cellular cement, plaster, or stone plates placed edgewise, and a suitable manner of connecting or strutting them, so that the whole wall may be guarded against cracking or bending. It is also suitable for building flat or domed, single or double ceilings, or bridges with straight or curved plates. In building single or double walls of cement or plaster blocks, &c., placed edgewise, in the first place clamps are employed, tightly connected with one another by means of pins passed through the same and ties, this fastening being allowed to remain until the mortar or cement has set. In double walls a double clamp is tied between both walls, and the fastening is allowed to remain. In the case of double walls for bridges, domes, flat roofs, and the like, both parts of the walls are connected by means of single, double, or elbowed clamps, the ends being thickened, hooked or provided with small discs, one end of such clamps being always cemented or built into one part of the wall, the clamps being arranged in such a way that they may be regarded as the panels of a bridge of which the two walls form the building pieces, and resist cracking or bending when suitably loaded. In carrying out his invention the inventor proposes to use cellular cement or plaster plates in which the cells are turned inwards.

249.—FIREPROOF FLOORS: *M. Fawcett and others.*—This patent relates to improvements in the construction of fireproof floors, and has for its object to effect a further improvement in the manufacture and use of the tubular lintels, described in the specification to Mark Fawcett, No. 2,815, February 25, 1888. The improvements consist in providing the lintels with a number of longitudinal flutings or grooves, into which the concrete keys or holds are pressed, thus preventing the tubes or lintels from being separated or falling away from the concrete in the event of fire acting on the ceiling below.

NEW APPLICATIONS FOR LETTERS PATENT.

APRIL 17.—7,746, T. Hundley, Moulding.—7,765, J. Whitehead, Automatic Door-fastener.—7,772, H. Hawgood, Door and Window Fastenings.—7,779, W. Pitt, Folding Gates.—7,786, A. Boult, Wood Coverings for Walls, &c.

APRIL 18.—7,813, A. Lowe, Combined Cross-grooving and Stop-grooving Plane.—7,868, J. Noel, Gully and Trap-heads, and in grids therefor.—7,877, B. Haigh, Flushing Syphons.—7,883, T. Scott, Brackets for Supporting Shelves in Shop Windows.

APRIL 19.—7,894, C. Haigh, Material for Use in the Construction of Pavements, Floors, Walls, Stair-treads, &c.—7,922, S. Perkins, Sink Traps.—7,941, B. Paddon, Joint for Earthenware, Stoneware, and Metal Pipes.—7,952, A. Taylor, Ratchet Brace.—7,955, G. Leadbetter, Hand Planes.

APRIL 20.—7,983, C. Oliver, Seats of Water-closets.—7,999, R. Jenkins, Machinery for Use in Tunnelling.—8,001, J. Urmson, Devices for Use in Painting or Cleaning Walls, &c.—8,014, G. Breeze, Sash-fastener.

APRIL 21.—8,067, R. Taylor, Apparatus for Cutting off Bricks at each side of the Brick-cutter.—8,101, O. Elphick, Water-closets.

APRIL 22.—8,133, H. Holland, Can and Brush-holder for Paints, Varnishes, &c.—8,147, D. Keith, Bath Fittings.—8,175, J. Pemberton, Apparatus for Opening and Cleaning Hair for Building Purposes.

PROVISIONAL SPECIFICATIONS ACCEPTED.

1,978.—B. Phillipson, Connexions of Water-closet Basins, &c.—3,997, C. Cox, Hinge for swinging Looking-glasses.—4,856, W. Mortimer, Bolts for Doors.—5,453, W. Oddy, Door Bells.—5,710, J. Tegg, Window or Sash-fasteners.—6,357, H. Fitzpatrick, Regulating the Discharge of Water from Cisterns.—6,461, C. Norris and G. Richmond, Heating, Cooling, and Ventilating Buildings and other Structures.—6,608, A. Giddings and J. McNaughton, Water-closet and other Cisterns.—6,620, Dallman, Water-closets.—6,708, F. Sator, Process and Composition for Polishing Wood.—6,979, C. Firth, Sawing or Cutting Stone.—7,042, J. Craven, Machines for Moulding Bricks, &c.—7,076, J. Honeyman, Ventilators.—7,234, R. Norris, Brick-moulding Machinery.

COMPLETE SPECIFICATIONS ACCEPTED.

(Open to Opposition for Two Months.)

10,389, F. Weldon, Temporary Bridges and other like Structures.—10,613, G. Davies, Window-jack or Scaffold.—19,618, C. Houghton, Windows.—22,490, C. Gibbs and C. Couse, Heating Bakers' Ordinary Brick Ovens.—3,854, E. Piper and G. Davis, Holding Window-blinds.—4,681, H. Berney, Planning and Arrangement of Dwellings of the Cottage Class.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

APRIL 20.—By *Dyer, Son, & Hilton* (at Lewisham): 113 and 115, Loampit Vale, Lewisham, f., 555*l.*

APRIL 24.—By *Wagstaff & Warman:* 186 to 192 even, Copenhagen-st., Islington, u.t. 56 yrs., g.r. 8*l.*, r. 166*l.*, 1,770*l.*; i.g.r. of 10*l.*, Copenhagen-st., u.t. 56 yrs., g.r. 2*l.*, 135*l.*; 38 and 40, Richmond-rd., Barnsbury, u.t. 48 yrs., g.r. 16*l.*, r. 94*l.*, 940*l.*—By *Baxter, Payne, & Lepper:* 52 and 53, Thorn-rd., Lambeth, u.t. 68 yrs., g.r. 11*l.* 10s., r. 76*l.*, 795*l.*; 10, Thavies Inn, Holborn, f., r. 185*l.*, 1,840*l.*—By *Eastman Bros.:* 71 and 73, Victoria-pk-rd., Hackney, u.t. 57 yrs., g.r. 20*l.*, r. 128*l.*, 1,250*l.*—By *White, Druce, & Brown:* the lease of 42, South Molton-st., Oxford-st., u.t. 14 yrs., r. 100*l.*, 250*l.*—By *Weatherall & Green:* 2, Chantry-rd., Brixton, u.t. 78 yrs., g.r. 6*l.* 10s., r. 38*l.*, 325*l.*; 14 and 24, Chantry-rd., u.t. 78 yrs., g.r. 13*l.*, 625*l.*; 9, The Grove, Clapham-rd., u.t. 48 yrs., g.r. 8*l.*, 745*l.*; a plot of f. land, Whistler-rd., Holloway, 40*l.*; a range of f. workshops, 270*l.*; 1, 2, 7, 8, 11, to 14, Whistler-rd., u.t. 87 yrs., g.r. 47*l.*, 795*l.*: 212, Fairbridge-rd., Hornsey Rise, u.t. 74 yrs., g.r. 7*l.*, r. 28*l.*, 160*l.*—By *Messrs. Spelman* (at Norwich): "Blegbie House," Heigham Grove, Norwich, f., 710*l.*

APRIL 25.—By *Broad & Wiltshire:* 14, Shirlock-rd., Gospel Oak, u.t. 84 yrs., g.r. 8*l.* 15s., 540*l.*; 8, Dynevor-rd., Stoke Newington, u.t. 81 yrs., g.r. 6*l.*, r. 30*l.*, 280*l.*—By *Dennant & Co.:* 34 and 36, Czar-st., Deptford, u.t. 70 yrs., g.r. 7*l.*, 440*l.*; 10 and 12, Brockley-rd., Lewisham, u.t. 34 yrs., g.r. 2*l.* 10s., r. 48*l.*, 400*l.*; 39, Darfield-rd., Brockley, u.t. 84 yrs., g.r. 4*l.*, 180*l.*—By *Messrs. Foster:* I.g.r. of 115*l.*, Fentiman-rd., Clapham-rd., u.t. 35 yrs., g.r. 14*l.* 8s., 1,540*l.*; i.g.r. of 71*l.* 10s., St. James's-rd., Brixton, u.t. 29 yrs., g.r. 11*l.*, 925*l.*; i.g.r. of 18*l.* 18s., Loughborough-rd., u.t. 29 yrs., no g.r., 275*l.*—By *Bean, Burnett, & Eldridge:* Five f. cottages, Hadley Green, 985*l.*; a plot of f. land, Upper Downs-rd., Epsom, 125*l.*—By *Newbon & Co.:* 29 and 33, Hoxton-st., Hoxton, f., r. 140*l.*, 1,510*l.*; 3, 5, 7, and 9, Rothery-st., Islington, f., r. 91*l.*, and 9A and 10A, Bath-pl., f., r. 39*l.*, 900*l.*; 64, Wrotham-rd,, Camden Town, u.t. 58 yrs., g.r. 10*l.*, r. 35*l.*, 250*l.*; f.g.r. of 25*l.*, Wrotham-rd., sold before auction; 58

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
School Buildings (650 seats) Morecambe ..	Poulton School Board	10 and 5 guineas	May 9
*New Municipal Buildings	Darlington Corp.....	.....	No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Police Station, Boscombe	County of Southampton	J. Robinson	May 6
School Buildings, Roseburn, Edinburgh..	St. Cuthbert & Dean School Board	R. Wilson	May 9
Road Metal, &c.	Abergavenny (High. B.	J. Gill.....	do.
Corrugated-iron Hospitals, Cwmcarn, Mon.....	Abercarn and Risca Local Boards	J. W. B. Rooke	do.
Public Coffee House, Wollaston, Northants	Public Coffee House Co. Lim.	.....	do.
Additions, &c. to Chapel, Woodland, Durham	.....	J. Moffatt	do.
Tramway Depot and Cottages	Plymouth Corp.	C. Chadwell	do.
Excavating Works	Accrington Corp.	H. Ross	do.
*Furniture for Free Library	Borough of West Ham	Lewis Angell	do.
*Oak Fencing and Gates	do.	do.	do.
*Laying Concrete Pavements.....	Hornsey Local Board	T. de Courcy Meade ..	do.
Widening and Re-constructing Two Roads, Llanedarne	Llandaff Highway Bd.	J. Holden	do.
Erection of a Theatre, Sheffield	.....	Starr & Cartwright....	do.
Construction of Sewers	Plymouth Corp.	J. D. Bellamy	do.
Stone Wall, Retaining Wall, &c.....	Rishton Local Board..	J. I. Helm.....	do.
Supplying and Laying Water Mains, &c..	Leigh (Lancs.) R.S.A.,..	T. W. Travers	do.
Villa Residence, Sleaford, Lincs.....	J. Hoole	J. Clare	do.
Granite Road Metal (2,000 tons)	Woolwich Local Board	*Official	do.
Brick Boundary Wall, &c. Peel Park.....	Salford Corporation ..	do.	do.
Erection of Gasworks, &c.	Bromyard (Hereford) Gas Light and Power Co. Lim.	do.	May 10
*Painting Works.....	West Ham Hospital ..	do.	do.
*Making-up Roads	Rochester Corp.	do.	do.
Drainage Works.....	Watford Local Board..	.....	do.
Additions and Alterations to Farm Buildings, Sebergham	J. Roper.....	.....	do.
Road Works, Drainage, &c. at Cemetery..	Chester Cemetery Co	.....	do.
Fourteen Dwelling-houses and One Shop, West Bowling, Bradford	.....	J. T. Parkinson	do.
Four Lock-up Shops, Halifax	.....	J. F. Walsh	do.
Dwelling-house, Hayle Towaris, Penzance	.....	O. Coldwell	do.
Five Cottages, Stangrounnd.....	M. Tow	.....	do.
Drainage Works.....	North Dublin Union..	T. H. Atkinson	do.
Bonded Stores, &c. Llanelly	Margrave Bros.	J. B. Morgan	do.
Supplying and Laying 1,100 yds. Earthenware Pipes	Fulwood Local Board	J. J. Myres	do.
*Extension of Cattle Market	Wellington (Salop) Market Co.	.....	do.
*Erection Pig and Cattle Pens	do.	.....	do.
Additions, &c. to Buildings	Bath Corporation	J. Amor.....	May 11
Re-building Premises, Berry-street, Belfast	.....	E. N. Banks	do.
Cottage, &c. Little Baddon, Essex.....	Chelmer & Blackwater Navigation Co.	F. Whitmore	do.
Erection of a Theatre, Rotherham.....	.....	J. Platts	do.
Villa Residence, Ruswarp	H. A. H. Rastall, J.P.	E. H. Smales	do.
Portland Cement	Cardiff Corporation ..	J. A. B. Williams	do.
Blue and Stock Bricks.....	do.	do.	do.
Workshops and Factory, Thornton-road, Bradford.....	.....	Milnes & France	do.
*Removal of Dust	Camberwell Vestry....	*Official	do.
*Removal of Street Refuse	do.	do.	do.
Granite Spalls, Road Metal, &c. New Brompton, Kent	Gillingham Local Bd..	do.	do.
Removal and Re-erection of Landing Stage.....	do.	do.	do.
Electric Light Generating Buildings.....	Salford Corporation ..	do.	do.
Asphalting Works.....	Manchester Union	do.	do.
*Main Drainage Works.....	Moss Side Local Board	J. Bowden	May 12
Nave, Aisle, and part of Tower of Church, Lofthouse, Yorks.....	.....	W. Watson	do.
Four Houses, Hoyland near Barnsley	W. Royston	W. J. Sykes	do.
Six Cottages, Pontypridd	J. Mackay	T. Rowland	do.
Pulling-down and Re-building Farm House, &c. Warley, Halifax.....	.....	J. Farrar	do.
Cottage Hospital, Fleetwood, Lancs.....	Hospital Committee ..	.....	do.
Four Houses, Birdwell, Yorks.....	F. Carr	W. J. Sykes	do.
Pulling-down and Re-building Inn, Wroughton, near Swindon	R. B. & C. L. Bowey ..	W. H. Read	May 13
Flagging, Channelling, Kerbing, &c.	Church Local Board ..	W. Stirrup	do.
Dwelling-house, Peterborough	Mrs. Lipscombe	J. Enddle	do.
Mission Church, Treorky, Wales.....	Building Committee ..	J. Rees	do.
Laying Cast-iron Water Mains, &c.	Hertford Corporation	T. R. Dickinson	do.
Sewering, Forming, Metalling, &c. Manor-street	Accrington Corp.	W. J. Newton	do
School Buildings	Wrexham T.C.	*Official	do.

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Temporary Iron Buildings.....	Sch. Bd. for London..	*Official	May 15
Public Conveniences, Hillsborough Park..	Sheffield Corporation	C. F. Wike	do.
Construction of Two Railways.....	Caledonian Rly Co....	G. Graham.....	do.
Construction of Main and Branch Sewers	Liversedge (Yorks) Loc. Board, ...	C. Gott	do.
*Broken Granite	Bermondsey Vestry ..	*Official	do.
Construction of Brick (960 yds.) and Pipe (1,320 yds.) Sewers, Carnlachie, Burn ..	District Committee of the Lower Ward of the County of Lanark	W. R. Copland.....	do.
Covering Outfall Sewers with Concrete....	Hartlepool Corp.	Crummack & Brown ..	do.
School Buildings	Great Yarmouth S.B.	Bottle & Olley	May 16
Road Metal, Kerbing, &c.	Reigate U.S.A.	F. D. Clark	do.
*Concrete Pavement in Situ.....	East Ham Local Board	Savage.....	do.
*Additions to Laundry.....	Brighton Council	J. C. May	do.
Additions, &c. to Infirmary, Torpoint, Devon	St. German's Union ..	*Official	do.
*Iron Fence and Gates, Peckham.....	LondonCounty Council	do.	do.
*Telegraph Offices and Shops, Taunton	Gt. Western Railway	do.	May 17
*Passengers' Station, Twyford	do.	do.	do.
Stables, &c. Fallowfield, Manchester.....	Manchester, Sheffield, & Lincolnshire Ry. Co.	do.	do.
Additions to School Buildings, East Donyland, Essex.....	National Schools Com.	.....	do.
Construction and Erection of Purifying House	Middleton Corp.....	T. Duxburry.....	do.
Road Metal, Shingle, &c. Boston, Lincs. ..	Kirton Parish Autho.	J. T. Barnett	do.
Isolation Block at Schools, Leavesden, Herts	St. Pancras Union	A. & C. Harston	May 18
*Subway at Workhouse.....	Kensington Guardians	T. D. Aldwinckle	do.
*Painting, &c. Caterham Asylum.....	Met. Asylums Board..	*Official	May 19
Supply of and Fixing Milestones.....	West Riding C. C.	J. V. Edwards	do.
Supplying and Laying 2,500 yds. Glazed Pipes.....	Weobley U.R.S.A.	R. L. Bamford.....	May 2
Formation, Flagging, &c. Mill-lane	Normanton Local Bd.	*Official	do.
*Sewerage Works.....	Oldham Corporation..	H. Law & Son	May 22
*Additions to Laundry, Gore Farm.....	Met. Asylums Board..	A. & C. Harston	do.
Draining Lower Nantille Lake, Wales	Nantille Vale Drainage Committee	L. H. Moorsom	do.
*Alterations, &c. at Workhouse.....	Thakeham Union	Scott & Cawthorne....	do.
*Hospital for Infectious Diseases	Birkenhead Corp.	C. Brownridge	do.
Supplying and Erecting of Refrigerating Plant, &c.	Manchester Corp.	M. C. Bannister	May 27
*Broken Granite	North Walsham L. B.	*Official	May 24
*Post Office, Burnley	Com. of H. M. Works	do.	May 26
*Keeper's Lodge, Canning Town	Borough of West Ham	Lewis Angell.....	May 30
Asylum Buildings, Workshops, &c. Glamorgan County Asylum, Parc Gwilt ..	....	Giles, Gough, & Trollope	May 31
*Tar Paving, &c.	London C.C. Asylums Committee.....	*Official	do.
*Construction and Maintenance of Sewerage Works	City of Cape Town....	Clement Dunscombe..	July 28
*Painting, &c. at Beverley Depot	War Department	*Official	No date
*Painting, &c. at Halifax Depot	do.	do.	do.
*Painting Works, Bedford and Colchester..	do.	do.	do.
Supplying and Fitting Purifiers.....	Elsecar, Wentworth, & Hoyland Gas Co.	.....	do.
*Church at Long Hanborough.....	.....	E. H. Lingen Barker..	do.
*Show Yard, Blackpool.....	Royal Manchester, Liverpool, and North Lancashire Agricultural Society	.....	do.
Post Office, Shop, and Dwelling-house, Norden, Lancs.....	M. Ashworth	Butterworth & Duncan	do.
Five Cottages, Bowes Park, London, N. ..	.....	W. Stevens	do.
Villa Residence, Wigan	.....	W. E. V. Crompton ..	do.
Kerbing, Channelling, Sewering, &c. Barley-lane Estate, Hastings	H. H. Hewlings	T. & J. Plowman.....	do.
Erection of a Butter Factory, Kilmallock, Ireland.....	The People's Butter Factory Co.....	.....	do.
Stables, &c. Leeds	Beverley Bros.	Swale & Mitchell.....	do.
School Buildings, &c.	Long Buckley Sch. Bd	C. Dorman.....	do.
Twelve Cottages, Llandebie	F. G. Southern.....	.....	do.
Fourteen Houses, Armley, Leeds	Ellison Bros.	.....	do.
Excavating and Levelling Estate, Leeds ..	J. W. Watson	.....	do.
School-Chapel, Burnley	Trustees of Primitive Methodist Chapel....	G. E. Bolshaw	do.
*Iron Fire Escape Staircases	Belper Union	J. B. Mason	do.
*New Theatre, Sheffield	.....	W. Emden.....	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Inspector of Nuisances	Swansea Town Council	120*l.*	May 16
*Assistant Sanitary Inspector	Wandsworth B.of Wks.	2*l.* 5*s.*	May 23
Lecturer on Practical Coal-Mining.....	Nottingham C.C.	250*l.* plus 50*l.*	May 27

Those marked with an Asterisk (*) are advertised in this number. *Competition, p. iv.* *Contracts, pp. iv., vi., and viii.* *Public Appointments, p. xxii.*

to 68 (even), St. Peter-st., Bethnal Green, u.t. 61 yrs., g.r. 25*l.* 4*s.*, 1,560*l.*; 70 to 98 (even), St. Peter-st., u.t. 62 yrs., g.r. 60*l.*, 4,200*l.*; 100 to 106 (even), St. Peter-st., u.t. 63 yrs., g.r. 19*l.*, 1,000*l.*; 39, 41, 43, Hague-st., f., r. 127*l.* 10*s.*, 1,540*l.*; 1 to 5, Kelsey-st., f., 1,340*l.*; 48, Abbey-st., f., r. 100*l.*, 1,290*l.*; 85, Worship-st., Shoreditch, u.t. 27 yrs., g.r. 80*l.*, r. 160*l.*, 820*l.*—By *Debenham, Tewson, & Co.*: 47, High-st., Whitechapel, f., r. 110*l.*, 2,350*l.*; f.g.r. of 138*l.* 10*s.*, Hosier-lane, West Smithfield, reversion in 51 yrs, 3,350*l.*; f.g.r. of 138*l.* 10*s.* Hosier-lane, reversion in 51 yrs., 2,900*l.*; "St. Mary's," West Heath-rd., Hampstead, f., r. 260*l.*, 5,000*l.*; 13 and 14, Deptford Broadway, Deptford, f., area 4,950 ft., 3,200*l.*; 17, Blackheath Hill, Blackheath, f., r. 40*l.*, 720*l.*; 106, Hither Green-lane, Lewisham, f., r. 38*l.*, 700*l.*; 1, Thornford-rd., f., 500*l.*; 79, Manor-rd., u.t. 70 yrs., g.r. 1*l.* 15*s.*, r. 42*l.*, 400*l.*; 41 and 43, Wickham-rd., u.t. 77 yrs., g.r. 17*l.*, 1,320*l.*; 86, Wickham-rd., u.t. 81 yrs., g.r. 9*l.* 7*s.* 6*d.*, 530*l.*; No. 479, New Cross-rd., u.t. 33 yrs., g.r. 12*l.*, r. 45*l.*, 320*l.*—By *Edwin Smith & Co.*: 3 and 4, College-hill, Cannon-st., f., 7,000*l.*; i.g.r. of 171*l.*, Monnery-rd., Holloway, u.t. 74 yrs., no g.r., reversion for 9 yrs., 3,785*l.*; i.g.r. of 100*l.*, Junction-rd., u.t. 74 yrs., no g.r., reversion for 9 yrs., 1,680*l.*; i.g.r. of 42*l.*, Tufnell-pk.-rd., u.t. 71 yrs., g.r. 1*l.* 5*s.*, 865*l.*; i.g.r. of 320*l.*, ditto, u.t. 74 yrs., g.r. 270*l.*, reversion for 9 yrs., 805*l.*; 2, 4, 8 to 30 (even), Monnery-rd., u.t. 74 yrs., g.r. 102*l.* 18*s.*, r. 614*l.*, 5,665*l.*; 3, 5, and 7, Archibald-rd., u.t. 74 yrs., g.r. 21*l.*, 132*l.*, 1,150*l.*

APRIL 26.—By *J. A. Trythall*: 23 and 25, Clifton-rd., Norwood, f., 1,200*l.*—By *P. Hodson*: 7 and 8, Carnarvon Villas, Finchley, u.t. 87 yrs., g.r. 11*l.*, r. 50*l.*, 400*l.*; four plots of f. land, Roxeth, Harrow, 65*l.*—By *D. Young*: 25, Great Queen-st., Lincoln's Inn, f., r. 120*l.*, 1,600*l.*; 61, Solon New-rd., Brixton, u.t. 86 yrs., g.r. 6*l.* 10*s.*, 290*l.*: No. 88 Clapham-rd., u.t. 27 yrs., g.r. 10*l.* 10*s.*, 340*l.*—By *D. Smith, Son, & Oakley*: the f. residence "Linden," Weybridge, r. 80*l.*, 1,225*l.*; the f. residence "Langham," Alton, Hants, and 5 a. 3 r. 35 p., 1,610*l.*; 5 to 16, Macclesfield-pl., Goswell-rd., sold before auction.—By *Mullett, Booker, & Co.*: 38, Senior-st., Paddington, u.t. 66 yrs., g.r. 5*l.* 6*s.* 6*d.*, r. 42*l.*, 360*l.*; 5, Buckland-cres., Belsize-pk., u.t. 58 yrs., g.r. 15*l.*, 785*l.*; 51, Speke-rd., Battersea, u.t. 71 yrs., g.r. 5*l.*, 140*l.*—By *R. Tidey & Son*: 35, 37, Stamford-rd., Kingsland, u.t. 25 yrs., g.r. 10*l.*, 380*l.*; f.g.r. of 41*l.*, St. Jude-st., Holloway, reversion in 39 yrs., 1,255*l.*; 66, Church-rd., Kingsland, u.t. 43 yrs., g.r. 5*l.* 10*s.*, 380*l.*; 46 and 48, Acton-st., u.t. 25 yrs., no g.r., 300*l.*; i.g.r. of 33*l.*, Wall-st., Islington, u.t. 30 yrs., g.r. 13*l.*, 310*l.*; i.g.r. of 33*l.*, Elm-pk., Brixton, u.t. 59 yrs.. g.r. 18*l.*, 255*l.*; i.g.r. of 80*l.*, Minerva-st., Hackney, u.t. 10 yrs., g.r. 26*l.*, 255*l.*; 78, Oakley-rd., Kingsland, u.t. 48 yrs., g.r. 6*l.* 6*s.*, r. 42*l.*, 425*l.*—By *Inman Sharp, Harrington, & Co.*: Profit rental of 100*l.* on 30, Chapel-st., Belgravia, and stabling, u.t. 10½ yrs., 630*l.*; 105 and 107, Byrne-st., Balham, u.t. 81 yrs., g.r. 12*l.*, r. 50*l.*, 465*l.*; 36 and 38, Penton-st., Pentonville, u.t. 19 yrs., net rent 53*l.*, 90.—By *A. Booth*: No. 376, Camden-rd., u.t. 49 yrs., g.r. 6*l.*, 560*l.*; 221, 227, 229, and 231, Junction-rd., Holloway, u.t. 63 yrs., g.r. 28*l.*, 1,295*l.*; 2 and 4, Anson-rd., u.t. 73 yrs., g.r. 10*l.* 10*s.*, 1,205*l.*; 177 and 179, Tufnell Pk-rd., u.t. 74 yrs., g.r. 12*l.*, r. 89*l.*, 860*l.*; 29, Dalmeny-rd., u.t. 75 yrs., g.r. 6*l.*, r. 38*l.*, 335*l.*; 114, Huddlestone-rd., u.t. 74 yrs., g.r. 7*l.*, r. 42*l.*, 445*l.*; 83, Mercer's-rd., u.t. 77 yrs., g.r. 7*l.* 10*s.*, r. 44*l.*, 465*l.*; 29, Cantlowes-rd., u.t. 68 yrs., g.r. 10*l.*, r. 42*l.*, 380*l.*; 114, St. George's-av., u.t. 74 yrs., g.r. 7*l.*, r. 42*l.*, 460*l.*; 66, St. George's-av., sold before auction.

APRIL 27.—By *A. Richards* (at Tottenham): 636 and 638, High-rd., Tottenham, f., r. 130*l.*, 2,705*l.*; 640 and 642, High-rd., f., r. 1,280*l.*; 654 and 656, High-rd., 1 to 4 and 4A, Hampton-rd., f., r. 175*l.* 8*s.*, 1,720*l.*; f.g.r. of 22*l.* 10*s.*, Hampton Cottages, reversion in 85 yrs., 460*l.*—By *Beale & Capps*: 123, Ladbroke-grove, Notting Hill, u.t. 69 yrs., g.r. 15*l.*, r. 75*l.*, 650*l.*; 206 and 208, Cornwall-rd., u.t. 69 yrs., g.r. 18*l.*, r. 110*l.*, 910*l.*—By *A. J. Sheffield*: 18 to 24 (even), Ettrick-st., Poplar, u.t. 80 yrs., g.r. 15*l.*, 670*l.*; three plots of f. land, Boleyn-rd., Upton-pk., 180*l.*—By *A. C. Lowry*: 1, 3, and 5, Canton-st., Poplar, u.t. 25 yrs., g.r. 9*l.*, 420*l.*—By *Stimson & Sons*: 105, Asylum-rd., Peckham, u.t. 53 yrs., g.r. 9*l.* 5*s.* 9*d.*, r. 30*l.*, 210*l.*; 84, Commercial-rd., u.t. 21 yrs., g.r. 4*l.*, 115*l.*; 50, 52, Gurney-st., Walworth, u.t. 50 yrs., g.r. 10*l.*, 680*l.*; 35 to 38, West-st., Bermondsey, u.t. 24 yrs., g.r. 10*l.* 7*s.* 6*d.*, 390*l.*; 10 and 11, Woodlands-pl., u.t. 34 yrs., g.r. 4*l.*, 225*l.*; i.g.r. of 61*l.* 10*s.*, Claylands-rd., &c., Clapham-rd., u.t. 30 yrs., g.r. 37*l.* 8*s.*, 350*l.*—By *C. C. & T. Moore*: 33 to 36, Halley-st., Limehouse, and 2 to 5, Lufton-pl., f., 800*l.*; 11 and 12, Park-rd, Mile End, f., 480*l.*; 31 to 37 (odd), Henniker-ter., Stratford, u.t. 74 yrs., g.r. 11*l.* 13*s.* 4*d.*, 810*l.*—By *Newbon & Co.*: 162, 164, 166, Brooke-rd., Stoke Newington, f., r. 100*l.*, 1,415*l.*; 2, 3, and 4, White Hart-ct., u.t. 36 yrs., g.r. 10*l.*, 135*l.*; 33, 35, Hanover-st., Islington, u.t. 43 yrs., g.r. 12*l.*, r. 80*l.*, 660*l.*; 3, 7, and 8, Canonbury-sq., Canonbury, u.t. 25 yrs., g.r. 10*l.*, r. 158*l.*, 1,160*l.*; 11 and 12, Canonbury-sq., u.t. 25 yrs., g.r. 4*l.*, r. 102*l.*, 695*l.*; 27, 29, 55, 56 and 57, Whistler-st., u.t. 87 yrs., g.r. 26*l.* 17*s.*, 650*l.*; 73, Almack-rd., Clapton, u.t. 79 yrs., g.r. 5*l.*, r. 28*l.*, 280*l.*; 4, Valentine-rd., Hackney, u.t. 42 yrs., g.r. 5*l.* 10*s.*, r. 24*l.*, 210*l.*—By *W. W. Jenkinson*: 11 to 19 (odd), Alma-rd., Wandsworth, f., r. 198*l.*, 1,505*l.*; 27 to 37 (odd), Alma-rd., u.t. 82 yrs., g.r. 42*l.*, 1,300*l.*; 1 to 11 (odd), Birdhurst-rd., u.t. 83 yrs., g.r. 45*l.*, 1,280*l.*; 1 to 9 (odd), Fullerton-rd., u.t. 82 yrs., g.r. 25*l.*, 860*l.*; 11 and 13, Fullerton-rd., u.t. 82 yrs., g.r. 9*l.*, 365*l.*; 37 and 39, Lindford-rd., Walthamstow, u.t. 83 yrs., g.r. 6*l.* 10*s.*, 130*l.*—By *W. W Read & Co.*: 175, Sandringham-rd., Dalston, u.t. 78 yrs., g.r. 10*l.*, 200*l.*; 1, Exmoor-st.,

Notting Hill, u.t. 92 yrs., g.r. 5*l.* 5s., 140*l.*; 44, Hever-st., u.t. 92 yrs., g.r. 5*l.* 5s., 135*l.*; 125, Battersea Rise, Battersea, u.t. 50 yrs., g.r. 8*l.*, r. 40*l.*, 300*l.*; 4, Glenisla-ter., u.t. 80 yrs., g.r. 7*l.*, 150*l.*; 6, Augusta-sq., Regent's-pk., u.t. 29 yrs., g.r. 10*l.*, r. 46*l.* 16s., 155*l.*; 45, Alfred-rd., Acton, u.t. 83 yrs., g.r. 9*l.*, 285*l.*; 12, Hungerford-rd., Camden Town, u.t. 41 yrs., g.r. 8*l.* 8s., r. 50*l.*, 365*l.*; 33, Kingsley-rd., Kilburn, u.t. 92 yrs., g.r. 6*l.*, 230*l.*; "St. Ronans," Earlsfield-rd., Wandsworth, f., r. 80*l.*, 1,000*l.*; twelve cottages, stabling and nursery ground, "Waverley Estate," Tottenham, u.t. 7 yrs., g.r. 62*l.*; and 1 g.r., 30*l.*, same term, 355*l.*

APRIL 28.—By *Green & Son:* 76 and 78, Golden-lane, Barbican, f., area 1,848 ft., f., r. 225*l.*, 2,750.—By *Herring, Son, & Daw:* 1, Gounne-rd., Rotherhithe, u.t. 35 yrs., g.r., 3*l.* 15s., 450*l.*—By *Rouch & Parkhouse:* 185, Jamaica-st., Stepney, u.t. 20 yrs., g.r. 4*l.*, r. 24*l.*, 155*l.*; 41, Bromley-st., u.t. 15 yrs., g.r. 1*l.*, r. 30*l.*, 165*l.*; 28, Anthony-st., St. George's-in-the-East, u.t. 7 yrs., g.r. 2*l.* 7s. 6d., 62*l.*; 12 and 46, Blakesley-st., u.t. 4 yrs., g.r. 11*l.*, 77*l.*—By *P. & G. Geen:* 47, Beaufoy-rd., Battersea, u.t. 76 yrs., g.r. 7*l.*, 200*l.*; 49, Beaufoy-rd., u.t. 76 yrs., g.r. 5*l.*, 160*l.*—By *T. B. Westacott:* 14 to 19, Charles-st., Somers Town, u.t. 34 yrs., g.r. 60*l.*, r. 256*l.*, 1,375*l.*; 100, Seymour-st., Euston-sq., u.t. 38 yrs., g.r. 15*l.*, r. 52*l.* 10s., 310*l.*; 10, Torbay-st., Kentish Town, u.t. 42 yrs., g.r. 8*l.* 8s.; and a g.r. of 4*l.* 4s., 220*l.*—By *Baker & Sons:* f.g.r. 35*l.*, Main-rd., Muswell Hill, reversion in 92 yrs., 670*l.*; 103, 105, Carlton-st., Kentish Town, u.t. 68 yrs., g.r. 12*l.*, 610*l.*; 90 and 92, Regina-rd., Finsbury-pk., u.t. 71 yrs., g.r. 12*l.*, 400*l.*; 15, Richmond-pk., u.t. 58 yrs., g.r. 6*l.* 10s., r. 28*l.*, 235*l.*; 56, 58, 60, Locksley-st., Limehouse, u.t. 66 yrs., g.r. 9*l.* 12s., 830*l.*; 1, 3, and 5, Giraud-st., Poplar, and a g.r. of 8*l.* 10s., u.t. 65 yrs., g.r. 17*l.*, 175*l.*; 2 and 4, Nelson-st., Canning Town, u.t. 61 yrs., g.r. 20*l.*, 85*l.*; 32, 34, 36, Clarkson-st., u.t. 93 yrs., g.r. 15*l.*, 160*l.*; 11, Stork-rd., Stratford, u.t. 87 yrs., g.r. 5*l.* 5s., 110*l.*; 13 to 21 (odd), Casterton-st., Hackney, u.t. 84 yrs., g.r. 32*l.* 10s., r. 156*l.*, 795*l.*; 101, 103, Elder-field-rd., Clapton, u.t. 77 yrs., g.r. 10*l.* 10s., 435*l.*

[*Contractions used in these Lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G.		
ton	9/0/0	0/0/0
Teak, E.I. .. load	9/0/0	15/0/0
Sequoia, U.S.ft.cu.	2/3	2/6
Ash, Canada load	2/10/0	4/0/0
Birch, do.	3/0/0	4/0/0
Elm, do.	3/10/0	4/10/0
Fir, Dantsic, &c.	1/10/0	3/5/0
Oak, do.	3/0/0	5/5/0
Canada	5/10/0	7/0/0
Pine, Canada red	2/10/0	3/10/0
Do. Yellow	2/10/0	4/10/0
Lath, D'ntsic, fath	5/0/0	6/0/0
St. Petersburg..	5/0/0	7/0/0
Deals, Finland		
2nd & 1st std 100	7/0/0	9/10/0
Do. 4th & 3rd ..	6/10/0	7/0/0
Do. Riga	6/10/0	8/0/0
St. Petersburg,		
1st yellow	10/0/0	14/0/0
Do. 2nd yellow..	8/0/0	9/0/0
Do. white	8/0/0	10/0/0
Swedish	7/0/0	15/10/0
White Sea.....	8/0/0	16/10/0
Canada, Pine 1st	21/0/0	28/10/0
Do. do. 2nd	15/10/0	17/10/0
Do. do. 3rd &c.	7/10/0	10/5/0
Do. Spruce, 1st	8/10/0	11/0/0
Do. do. 3rd &		
2nd	6/15/0	8/0/0
New Brunswick	6/10/0	7/10/0
Battens, all kinds	3/0/0	15/0/0
Flooring boards,		
1¼ in. prep.		
1st	0/0/0	0/15/6
Do. 2nd	0/8/0	0/11/6
Other qualities—	0/4/6	0/7/6
Cedar, Cuba ..ft.	¼	¼
Honduras, ..&c	¼	¼
Mahogany, Cuba	¼	¼
St. Domingo,		
cargo av.	¼	1/6
Mexican do. do.	⅓	¼
Tobasco do. do.	⅓	⅙
Honduras do. ..	¼	⅙
Box, Turkey ton	4/0/0	13/0/0
Rose, Rio	9/0/0	20/0/0
Bahia	8/0/0	18/0/0
Satin, St. Do-		
mingo .....ft.	0/0/6	0/1/3
Porto Rico.....	0/0/7	0/1/6

TIMBER (*continued*).		
Walnut, Italian ..	0/0/3½	0/0/7
METALS.		
Iron—Pig, in Scot-		
land .....ton	2/0/8½	0/0/0
Bar, Welsh, in		
London	5/17/6	6/0/0
Do. do. at works		
in Wales.....	5/7/6	5/10/0
Do. Staffordshire,		
in London.....	6/0/0	6/10/0
COPPER—British,		
cake and ingot	47/10/0	48/0/0
Best selected ..	49/0/0	49/5/0
Sheets, strong..	56/0/0	57/0/0
Chili, bars	44/7/6	44/15/0
YELLOW METAL	0/4 13-16	0/5
LEAD—Pig,		
Spanish.....ton	9/13/0	9/15/0
English com.		
brands	9/15/0	9/17/6
Sheet, English,		
6 lbs. per sq. ft.		
and upwards....	11/0/0	0/0/0
Pipe.....	11/10/0	0/0/0
ZINC—English		
sheet.....ton	22/0/0	0/0/0
Vieille Mon-		
tagne	22/10/0	0/0/0
TIN—Straits.....	93/2/6	93/12/6
Australian.....	93/15/0	94/5/0
English Ingots..	96/0/0	96/10/0
Banca	93/10/0	94/0/0
Billiton	93/5/0	93/10/0
OILS.		
Linseed .....ton	20/0/0	20/2/6
Cocoanut, Cochin	28/10/0	0/0/0
Do. Ceylon	26/15/0	0/0/0
Palm, Lagos.....	27/0/0	0/0/0
Rapeseed, English		
pale	25/10/0	0/0/0
Do. brown	24/0/0	0/0/0
Cottonseed ref....	21/10/0	0/0/0
Oleine	22/0/0	24/0/0
Lubricating, U.S.	4/0/0	5/0/0
Do. refined	5/10/0	12/0/0
TAR—Stockholm		
barrel	0/18/6	0/0/0
Archangel.....	0/12/6	0/0/0

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.*]

BALTINGLASS (Ireland).—For the erection of a cottage, Williamstown; construction of sewers and tanks at Fever Hospital, &c., for the Union Guardians. Mr. J. J. O. Ramsay, architect, Dunlavin. Quantities supplied by the architect:—

Cottage.

L. Doyle	£100	Jas. Lynch, Tullow*	£91

* Accepted.

Sewerage Works.

E. & R. Warren	£137	John Flinn, Baltinglass*	£104
P. Nolan	135		

* Accepted.

BARNSLEY.—Accepted for the erection of a cemetery chapel and lodge, Hemingfield, for the Wombwell Local Board. Mr. Jno. Robinson, Surveyor, Park-cottage, Wombwell, Barnsley. Quantities by the surveyor:—

Excavator, Mason, and Bricklayer.—Wm. Broadbent, Wombwell, Barnsley	£1,323 10 0
Carpenter and Joiner.—C. Linford, Wombwell	249 0 0
Tiler.—C. Kemp, Swinton, Rotherham	58 0 0
Plasterer.—P. Holdsworth, Park-lane, Bradford	26 10 0
Plumbing, Glazing, and Painting.—Snowdon & Son, Market-street, Barnsley	59 7 6

BELPER.—For the construction of works of sewerage and sewage disposal, Marehay, for the Rural Sanitary Authority. Mr. Robert Argile, Engineer, Ripley, near Derby. Quantities by the Engineer:—

J. Hawley & Son	£2,843 12 6	G. F. Todd	£2,275 0 0
Wain & Coupe	2,463 19 4		

BENFLEET (Essex).—Accepted for erecting three houses, for Mrs. Harding:—

Multon & Wallis, Gravesend £1,050

BOLTON.—Accepted for the sewering, flagging, paving, &c., of Hoyle-street and four other streets, also sewering six streets, for the Astley Bridge Local Board. Mr. W. J. Lomax, Surveyor, 11, Fold-street, Bolton:—

Thomas Kilburn, Arrowsmith-terrace, Bolton.
[At schedule of prices.]

BRADFORD (Yorks).—Accepted for the erection of houses, alterations, and forming new street, Bank Top Mills, Great Horton, for Mr. Thomas Priestley, Bank Top Mills, Great Horton, Bradford. Mr. J. Drake, architect, Winterbank, Queensbury. Quantities by the architect:—

Masons.—Balmforth & Reece, Clayton Heights, near Bradford	£575 0 0
Joiner.—John Patchett, Clayton Heights, near Bradford	66 0 0
Slaters.—Thornton Bros., Barkerend-road, Bradford	13 5 0
Plasterer.—S. Sunderland, Great Horton	32 0 0
Plumber.—Michael Stocks, Queensbury	26 10 0
Painters.—Jennings & Whittaker, Queensbury	30 4 6

BUSHEY (Herts).—Accepted for the erection of shop and private house at Bushey, for Mr. S. E. Badmington. Messrs. Pridmore & Anderson, architects, Watford:—

Neale & Caine £450 0 0

CAMBORNE.—For the erection of two shops and dwellings, Market-place, for Mr. W. W. Hockin. Mr. Jas. Hicks, architect, Redruth:—

A. Carkeek	£1,630	A. Delbridge	£1,309
S. Trehane	1,600	R. Rettle, Camborne*	1,270
J. Julian	1,415	A. Nicholls	1,250

* Accepted.

CANTERBURY.—For the erection of cast-iron fence, brick wall, wrought-iron gates (three), &c., for the Corporation. Mr. Frank Baker, Engineer, Vernon House, Canterbury. Quantities supplied:—

D. Forbes & Co	£410 18 0	Drury & Biggleston,	
W. Cozens	323 7 10	Canterbury*	£278 7 10
		Johnson & Co.	276 17 0

* Accepted.

CROYDON.—For the erection of residence on the Friends' School Estate, for Mr. G. G. Knolt. Mr. G. Punnett, architect, Park-lane, Croydon:—

Maides & Harper	£1,095	E. J. Saunders	£1,020
Young & Lonsdale	1,076	J. W. Trappit	1,005
Smith & Sons	1,065	M. Taylor	973

DARTFORD (Kent).—Accepted for erecting twenty-three cottages, for Mr. G. Tomlinson. Mr. Wooller, architect, Dartford:—

Multon & Wallis, Gravesend £4,390 0 0

DOVER.—For the construction of foundations, &c., in Cannon-street, for the Town Council. Mr. Walter Thomas, Surveyor:—

H. Stiff	£619 0 0	W. Bromley, Priory	
J. J. Hall	496 10 9	Grove (accepted)	£488 0 0
G. Lewis & Sons	455 0 0		

EASTBOURNE.—For partially rebuilding the "Anchor" Hotel, Eastbourne, for Mr. E. W. Robins. Messrs. Clayton & Black and Mr. A. E. Oakden, joint architects:—

	Estimate No. 1.	Estimate No. 2.
Tupper	£3,395	....
Martin	3,117	£689
Deacon	3,058	680
Garrett	2,905	794
Peerless	2,770	689

FINGRINGHOE (Essex).—For the reconstruction of a bridge, Manwood, for the Essex County Council. Mr. Percy J. Sheldon, engineer, Chelmsford. Quantities by Mr. G. Lamb, Barking:—

Wilkinson Bros.	£1,573 13 0	W. Griffiths	£1,099 4 1
G. Double	1,173 0 0	S. Parmenter, Brain-tree (accepted)	1,048 0 0

[Engineer's estimate, £1,100.]

FULHAM,—For fitting up hot-water supply and warming apparatus at the Diphtheria Wards in course of erection at the Western Hospital, Seagrave-road, Fulham, for the Metropolitan Asylums Board. Messrs. A. & C. Harston, Architects, 15, Leadenhall-street, E.C.:—

E. Oldroyd	£1,780 0	J. F. Clark	£934 10
Harper Twelvetrees ..	1,189 0	May Bros.	915 0
Clements, Jeakes, & Co.	1,121 15	H. Conolly	880 0
Sugg & Co.	1,075 0	J. C. & J. S. Ellis	824 17
Comyn, Ching, & Co.	1,072 0	Murdock & Cameron*	787 0
Jenkins & Sons	956 0		

* Accepted.

FULHAM.—For external painting and repairs at the Western Hospital, Seagrave-road, Fulham, for the Metropolitan Asylums Board. Messrs. A. & C. Harston, Architects, 15, Leadenhall-street, E.C.:—

J. & C. Bowyer	£683	M. Batchelor	£364
W. E. Martin	627	Lilly & Lilly	349
Akers & Co.	625	Proctor	330
A. J. Prout	479	W. & E. Mills (accepted)	325
G. Foxley	470		

GRAVESEND (Kent).—For rebuilding the "City of London" Hotel, for Mr. Hooper. Mr. B. Elson, architect:—

Turtle & Appleton	£2,955	Tuffee	£2,575
Lee & Son	2,775	Multon & Wallis, Graves-end (accepted)	2,492

KILKEEL (Co. Down).—Accepted for the erection of the Rectory, Kilkeel, Co. Down, for the Rev. Freeman Dudley, M.A. Mr. Max Clarke, architect:—

Messrs. Mill, Newcastle £1,015 0 0

LEWES.—For building new race stand, telegraph room, &c., at Lewes Race Course. Messrs. Holland & Son, architects and surveyors, Newmarket. No quantities:—

W. Marriage	£3,375	James Longley & Co., Crawley (accepted)	£2,975
A. M. Deacon	3,369		

LONDON.—For providing and laying on existing concrete foundation about 11,600 square yards of creosoted deal blocks, in Fulham-road, for the Vestry of the Parish of Fulham. Mr. J. P. Norrington, Surveyor to the Vestry:—

Nowell & Robson	£7,207	G. Wimpey & Co.	£6,185
J. Biggs	6,300	E. Parry	5,850

LONDON.—For excavating for, and providing and laying on 6 in. Portland cement concrete, about 2,000 square yards of creosoted deal blocks in Rylston and Sherbrooke-roads, for the Vestry of the parish of Fulham. Mr. J. P. Norrington, Surveyor to the Vestry:—

Nowell & Robson	£1,586	J. Biggs	£1,350
Geo. Wimpey & Co.	1,389	E. Parry	1,330

LONDON.—For the erection of the "Prince and Princess of Wales" public-house, Kinglake-street, Old Kent-road, S.E., for Mr. Crisp. Mr. E. B. I'Anson, architect. Quantities by Messrs. D. Campbell & Son:—

Jerrard	£3,639	Smith, Eldon Works	£3,485
Grover & Son	3,616	Smith, Camberwell	3,445
Canning & Mullins	3,600	Balaam Brothers	3,360
W. Downs	3,585	Young & Lonsdale*	3,213
Rider & Son	3,518		

* Accepted.

LONDON.—For the erection of the "Portland Arms" public-house, Lower Clapton-road, for the Camden Brewery Company. Messrs. Edmeston & Gabriel, architects. Quantities by Messrs. Tasker & Son:—

Fuller	£1,750	Godfrey & Sons	£1,583
W. A. Prlors	1,685	Young & Lonsdale*	1,497
Carmichael	1,595		

* Accepted.

LONDON.—For the wood-paving of Fulham-, Rylstone-, and Sherbrooke-roads with creosoted deal blocks, for the Fulham Vestry. Mr. J. P. Norrington, Surveyor:—

Nowell & Robson	£8,793	Wimpey	£7,574
Briggs	7,650	Parry	7,180

[Surveyor's estimate, £5,826.]

LONDON.—For pulling down and rebuilding "The Crown and Anchor" public-house, No. 43, Paul-street, and No. 66, Leonard-street, Finsbury, E.C., for Messrs. Percy & Co. Mr. R. W. Hobden, architect, 14, Devonshire-street, E.C. Quantities supplied:—

Gould & Brand	£3,593 0	Jones	£3,275 0
Little	3,589 0	Holloway	3,200 0
Martin, Wells, & Co. ..	3,557 0	Burman & Sons	3,200 0
Lyford	3,550 0	Deacon	3,149 0
Toms	3,439 0	Scrivener & Co.	3,139 0
Vears & Co.	3,390 9	Walker Bros.	3,062 0
Harris & Wardrop	3,343 0		

LONDON.—For erecting two houses and shops at Camberwell Green, for Mr. Arnold Gabriel. Messrs. Lewis Solomons and Carrington Arnold, architects:—

	With terra-cotta.		
Hall, Beddall & Co.	£3,125		£3,110
Downs	3,000		2,990
Boyce	2,923		2,933
Scott	2,900		2,923
Batley	2,687		2,697
Patman & Fotheringham	2,673		2,683
Coulsell	2,647		2,652
Holloway	2,630		2,650
C. Norman Philips (accepted)	2,497		2,482

LONDON.—For rebuilding No. 56, Gloucester-street, W.C., for Mrs. A. M. Green. Messrs. Saville & Martin, architects, Dacre House, Arundel-street, Strand, W.C. Quantities supplied:—

C. Dearing & Sons	£1,599	S. Goodall	£1,493
A. Bush & Sons	1,580	D'Oyley & Co.	1,449
Gould & Brand	1,530	Puzey & Lumley (accepted)	1,360

LONDON.—Accepted for alterations and repairs to "The Chancery" public-house, 309 and 310, Holborn, W.C., for Mr. J. R. Hands. Messrs. Saville & Martin, architects, Dacre House, Arundel-street, Strand, W.C.:—

General Contract.—A. Bush & Sons	£1,196 0 0
Gasfitter.—H. F. Grant	105 0 0
Pewterer.—T. Heath	143 0 0
Total	1,444 0 0

LONDON.—For rebuilding premises, St. George's-street and Ship-alley:—

	B.	C.
Little	£1,789	£1,098
Yerbury	1,630	1,000
Outhwaite	1,625	938
Worden and Easton	1,393	819
Holliday	1,340	810
Garrard & Son	1,299	851
Ackworth	1,280	590
Kiddle	1,175	922

LONDON.—For sundry repairs, St. George's-street:—

Yerbury	£875	Worden & Easton	£722
Holliday	850	Garrard & Son	490
Gardner	778	Ackworth	430

LONDON.—For the erection of a boundary wall round a reservoir, Holt Whites' Hill, for the Enfield Local Board. Mr. W. Kitteringham, Surveyor, Court House, Enfield:—

A. Parker	£760 0	A. Fairhead & Son	£548 10
W. Newman	730 0		

LONDON.—For the erection of a villa residence, Bowes Park. Mr. J. G. Needham, architect, 11, Powerscroft-road, Clapton:—

Say	£640	Wells	£390
Worden & Easton	482		

LONDON.—For paving, kerbing and channelling, and other works in connexion with widening King's-road by Church-street, Fulham, for the Vestry of the Parish of Fulham. Mr. J. P. Norrington, Surveyor to the Vestry:—

Nowell & Robson	£296	G. Wimpey & Co. (accepted)	£246

LONDON.—For alterations and additions at "Bedford Park Hotel," Streatham, for Mr. Morris Hart. Mr. E. E. Niblett, architect, 11, Union Chambers, Wormwood-street. Quantities by Mr. S. J. Thacker, 22, Montague-street, Russell-square:—

Lawrence & Son	£1,252	Gough & Co.	£1,054
Turtle & Appleton	1,137	Burman & Son	1,050
W. H. Walker	1,096	Carmichael & Co.	1,016
Dearing & Son	1,085	Courtney & Fairbairn	973

LONDON.—For the erection of two villa residences at Brockley, for Mr. H. R. Richardson. Mr. W. Barnett, architect, Winchester House, Old Broad-street, E.C.:—

Allen & Co.	£2,995 0	J. & C. Bowyer	£2,561 0
W. J. & H. Reed	2,951 17	Garrett & Son	2,520 0
United B. & C. Assn.	2,845 0	Pearce & Co.	2,480 0
Maxwell Bros.	2,699 0	Newman	2,470 0
J. H. Hunt	2,571 0	W. Smith	2,293 0

LONDON.—For the construction of 590 ft. of road and sewers, Chiswick, for Mr. H. George Smallman. Messrs. F. and W. Stocker, surveyors, 90-91, Queen-street, Cheapside, London, E.C. No quantities:—

T. Adams	£740 0 0	J. Mears	£675 0 0
Hoare & Sons	730 0 0	Nowel & Robson	670 0 0
Neave & Son	445 0 0	Killingback & Co.	
M. N. Rhodes	620 0 0	Camden Town*	429 0 0
Thomas Rook	586 9 6	W. Parker	505 0 0
Wimpey & Co.	462 0 0		

* Accepted.

LONDON.—For alterations to "The Neeld Arms" public-house, Harrow-road, W., for Messrs. E. W. & H. White. Mr. H. Roberts, architect, 113, Lewisham-road, S.E. No quantities:—

Lascelles & Co.	£2,997	J. Vears & Co.	£2,553
Rodwell	2,700	Godson & Sons	2,495
Todd	2,595	Edwards & Medway	2,420

LONDON.—For pulling down and rebuilding 45, Great Portland-street, W., for Mr. Hill. Messrs. Brunsden & Henderson, architects, 47, Pall Mall, S.W. Quantities supplied:—

J. Vears & Co.	£1,479	E. Toms	£1,417
Gould & Brand	1,477	S. R. Lamble	1,369
J. W. Dixon	1,439	J. Jarvis & Sons	1,274
F. Saunders	1,417		

LONDON.—For painting and other repairs at St. Bartholomew's Hospital, E.C., for the Governors:—

Young & Lonsdale	£792	Charteris	£759
Pitcher	789	Pitman & Son	734

LONDON.—For new shop-front, and repairs to Fairland House Romford-road, Stratford, E., for Mr. A. McCandlish. Mr. Fred A Ashton, architect, 3, Crooked-lane, E.C.:—

J. & H. Cocks	£179	Hearle & Farrow	£150
Coulsell Bros.	167	J. & F. Bane*	133
F. Voller	166		

* Accepted.

LONDON.—Accepted for new office fittings, &c., for the National Telephone Company. Mr. W. E. Deane, architect:—

Maxwell Bros. £120

LONDON.—For repairs to Oak Lodge, King's-road, Clapham Park. Messrs. Glasier & Sons, architects:—

Andrew & Nanson	£212	Maxwell Bros., Limited	£189

LONDON.—Accepted for alterations and decorations at No. 47 Highbury New Park, for Mr. Edmund Miller:—

William Reason, Clerkenwell (at Schedule of Prices).

LOUGHBOROUGH.—For constructing sewage disposal works for the Borough of Loughborough, Contract 2. Mr. Ambrose W. Cross, Borough Engineer :—

D. Barry	£6,114 8 6	J. Tomlinson	£4,621 13 4
T. Smart	5,750 0 0	J. Bentley	3,952 0 0
H. Vickers	4,782 10 6	J. Mason, Leicester*	3,925 0 0
B. Cooke & Co.	4,726 15 6		

* Accepted.
[Engineer's estimate, £3,993 7s. 6d.]

LUDLOW.—Accepted for the supply of cast-iron pipes, sluices, hydrants, &c.; laying same; erection of underground service tank; well-sinking; erection of small pumping-station, and machinery for the Craven Arms Waterworks, for the Rural Sanitary Authority. Mr. W. Wyatt, engineer, Pride Hill, Shrewsbury :—

Cast-iron Pipes and Fittings.

	Per ton.		
	4 in.	3 in.	1½ in. Specials.
	£ s. d.	£ s. d.	£ s. d. £ s. d.
Firmstone Bros., Stourbridge	4 6 3	4 6 3	4 7 6 7 17 6

Pipe-laying.

	Per yard.			Each.		
	4 in.	3 in.	1½ in.	4 in. Valves.	3 in. Valves.	Hydrants.
	d.	d.	d.	s. d.	s. d.	s. d.
W. Bryan, Ludlow	10½	9½	9	6 4	6 0	5 6

Machinery.
Coalbrookdale Company, Shropshire £240 0 0

Service Tank.
Bickerton & Maddocks, Shrewsbury £495 0 0

Pumping Station.
Bickerton & Maddocks, Shrewsbury £158 0 0

MALDON (Essex).—For the erection of a shop, High-street, for Mrs. Wade. Mr. P. M. Beaumont, A.M.Inst.C.E., architect, Maldon :—

T. Wilding	£900 0 0	Dines & Son	£864 12 6
J. Gozzett (accepted)	894 10 0	[All of Maldon.]	

PLAISTOW (near Bromley, Kent).—For the drainage of the Cemetery for the Burial Board of St. Mary's, Plaistow. Messrs. Wadmore, Wadmore, & Mallett, architects, 35, Great St. Helen's E.C. Quantities by Messrs. Stangar & Son, 21, Finsbury-pavement, E.C. :—

Mowlem & Co.	£1,223 0	Cooke & Co.	£745 0
Iles	1,169 0	Lansbury	661 10
Rigby	1,094 19	Neve & Son	612 0
Rogers & Co.	890 0	Jackson	600 0
Mays & Co.	765 0		

PONTYPRIDD.—For the erection of shops in Market-square, for the Market Company. Mr. A. O. Evans, architect, Town Hall, Pontypridd. Quantities by the architect :—

A. Richards	£2,700 12 0	D. C. Jones & Co.	£2,263 0 0
Williams & James	2,490 0 0	D. Jones	2,261 6 11
Watkin Williams	2,450 0 0	M. Julian	2,244 0 0

PORTSMOUTH.—For alterations and additions to school buildings (Buckland, Wellington-place, and Albert-road, Southsea), for the School Board. Mr. Alfred H. Bone, architect, Cambridge-Junction, Portsmouth :—

W. R. & C. Light	£3,538	E. & A. Sprigings	£3,000
W. W. Learmouth	3,474	A. W. Bevis	2,880
J. W. Ward	3,418	J. Crockereell	2,879
J. W. Perkins	3,355	J. Biden	2,835
J. P. Hall	3,174	H. Jones, Southsea*	2,790
A. E. Porter	3,150	C. Harding†	1,393

* Accepted. † Albert-road only.

SHERBORNE (Dorset).—Accepted for building seven cottages, for the Sherborne Cottage Building Co., at Westbury. Mr. Thomas Farrall, architect, Sherborne :—
Wm. Barrett, Sherborne £1,160 0 0

SHERBORNE.—For additional bedrooms at the Yeatman Hospital, for the Trustees. Mr. Thomas Farrall, architect, Sherborne :—
L. A. Penny, Sherborne £185 16 6

SHERBORNE.—For rebuilding two cottages, Long-street, for Mr. H. Cox. Mr. Thomas Farrall, architect, Sherborne :—
Penny & Hebdidch, Sherborne £198 0 0

SOUTH SHIELDS.—Accepted for the erection of two dwelling houses and shops in Westoe-road, South Shields, for Mr. Henry Chapman. Mr. Henry Grieves, architect, Albany Chambers, South Shields ;—
Alex. Ross (South Shields) £1,080 0 0

SOUTH SHIELDS.—For alterations to property situate in Fowler-street, South Shields, for Mr. C. F. Shotton. Mr. Henry Grieves, architect, Albany Chambers, South Shields ;—

R. Goodwin	£315 0	Wm. Scott	£277 11
W. J. Robertson*	285 0		

*Accepted.

STOKE-ON-TRENT.—For restoring the tower of the Church of St. Werburgh, Kingsley, Stoke-on-Trent. Mr. Abraham Mosley, architect and surveyor, Goodyear Chambers, Abington-square, Northampton :—

Section I. (up to bed of Cornice mould).

W. Alcock	£249 0 0
G. Goldstraw, Stoke-on-Trent*	205 11 6

Section III. (Parapets, lead roof, &c.)

W. Alcock	£276 0 0
G. Goldstraw	185 5 6

* Accepted.

STOKE-ON-TRENT.—Accepted for erecting a mission church in Kingsley Moor, Stoke-on-Trent. Mr. Abraham Mosley, architect and surveyor, Goodyear Chambers, Abington-square, Northampton :—
William Alcock, Cheadle, Stoke-on-Trent £197 0 0
[Bricks, lime, and carting supplied free.]

WALTHAMSTOW.—For alterations and additions to the "Grove" Tavern, Grove-road, Walthamstow, E., for Messrs. Savill Bros. Mr. Fred A. Ashton, architect, 3, Crooked-lane, E.C. :—

W. Watson	£1,600	A. Reed & Son	£1,300
W. Shurmur	1,559	J. & H. Cocks	1,275
F. Voller	1,460	Hearle & Farrow*	1,275

* Accepted.

WALTHAMSTOW.—Accepted for the construction of about 453 yds. and 1,222 yds. of oval brick sewer, and for re-laying 1,075 yds. of pipe-sewer for the Local Board. Mr. Geo. W. Holmes, C.E., Surveyor to the Board, Town-hall, Walthamstow. Quantities by Mr. J. Leaming :—
J. Reeves, Walthamstow £4,486 0 0

WANSTEAD (Essex).—For the erection of a detached house and stabling in Church-road, Wanstead, N.E. Mr. Herbert Riches, architect, 3, Crooked-lane, King William-street, London, E.C. :—

E. Cains	£1,550	Osborn & Sons	£1,525
J. Jolliffe	1,545	F. L. Willmott*	1,478
J. Catley	1,525		

*Accepted.

WEST HAM.—For the erection of the Upton-lane Schools, to accommodate 1,472 children, for the West Ham School Board. Messrs. J. T. Newman & Jacques, Architects to the Board, 2, Fen-court, E.C. Quantities by Messrs. R. L. Curtis & Son :—

Goodchild	£19,978	Sharpe	£17,400
Fulcher	18,951	Maddison	17,060
Hosking	18,745	Reed & Son	16,950
Catley	18,600	Gregar & Son*	16,933
Hearle & Farrow	17,982		

* Accepted subject to the approval of the Education Department.

WETTON (Staffs.).—Accepted for repairs and alterations to the Church of St. Margaret's. Mr. Larner Sugden, architect, Leek. Quantities supplied :—
D. W. Bassett, Hulme-road £564 5 0

WINCANTON (Somerset).—For contract No. 2, additions at the "Dolphin" Inn. Mr. Thomas Farrall, architect and surveyor, Sherborne :—
Thos. Green, Wincanton £285 0 0

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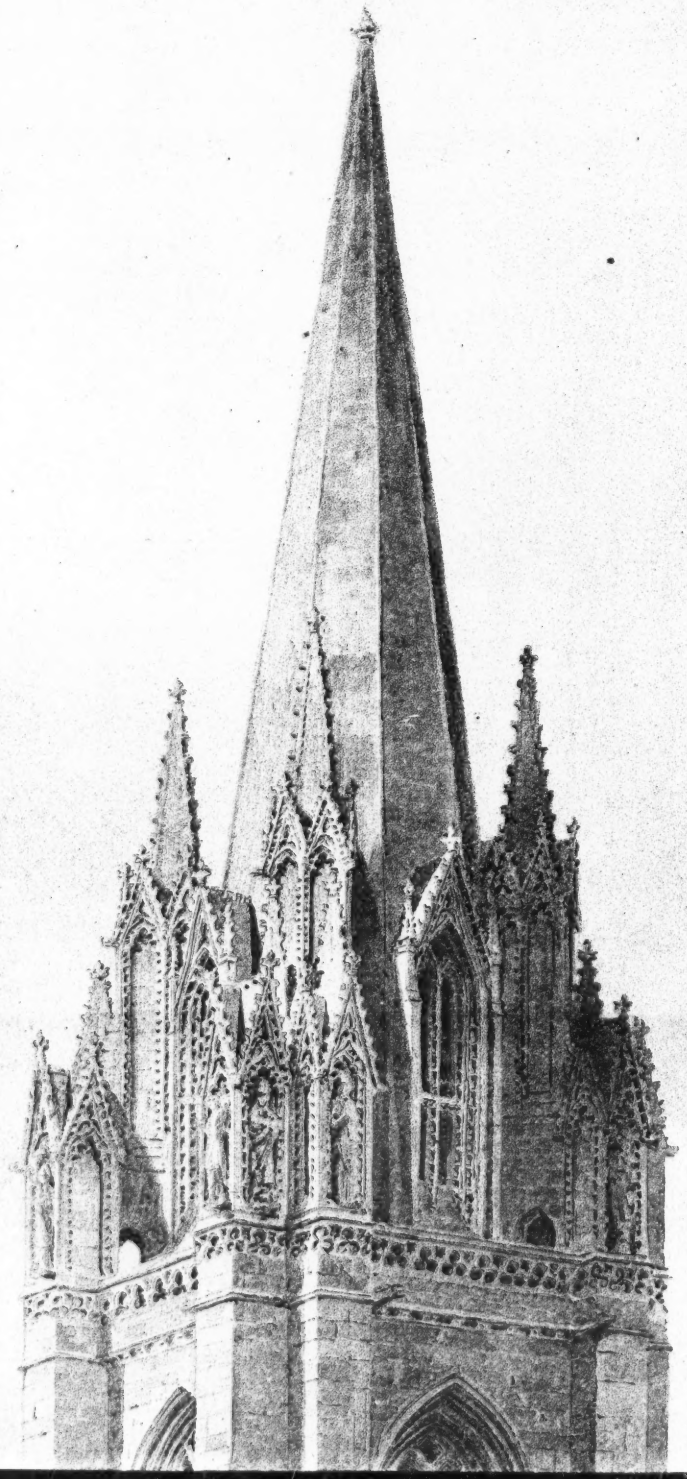

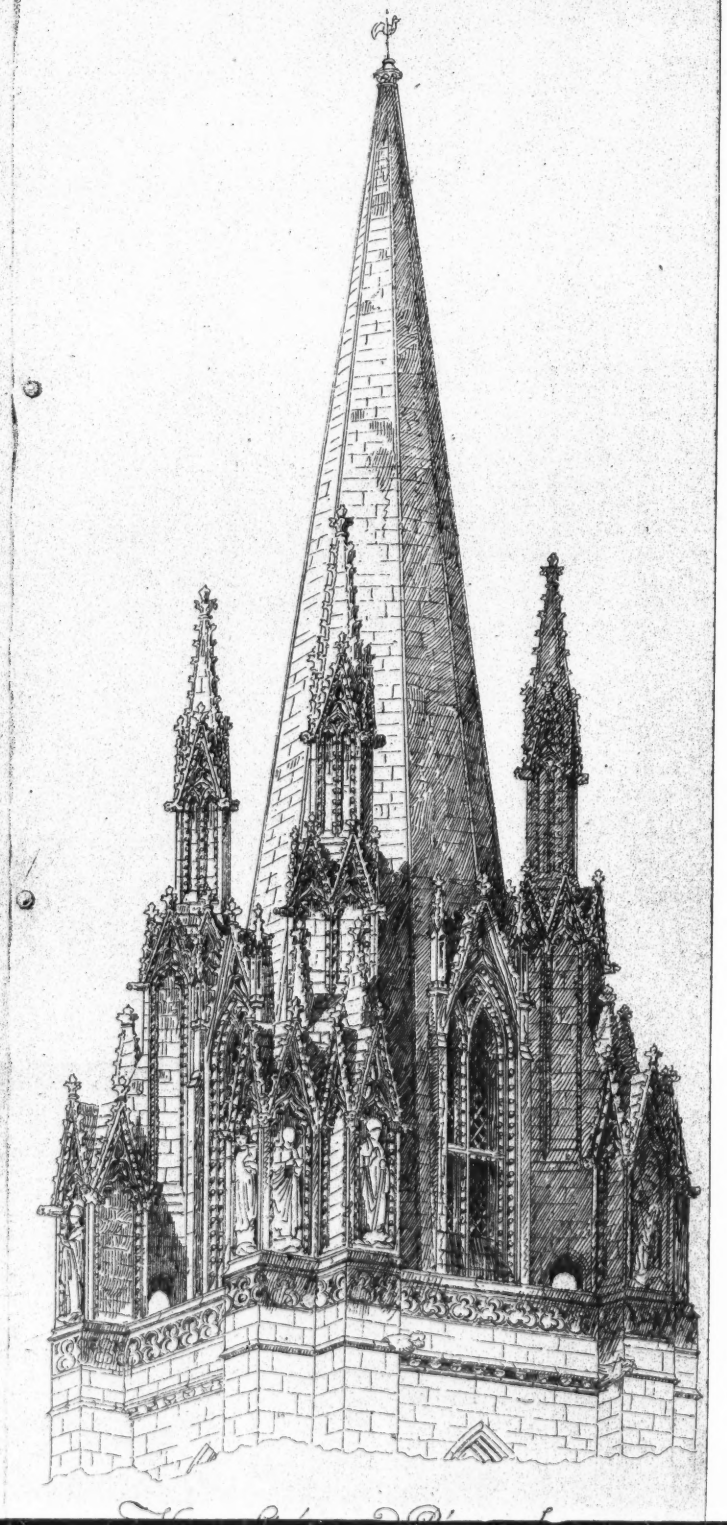

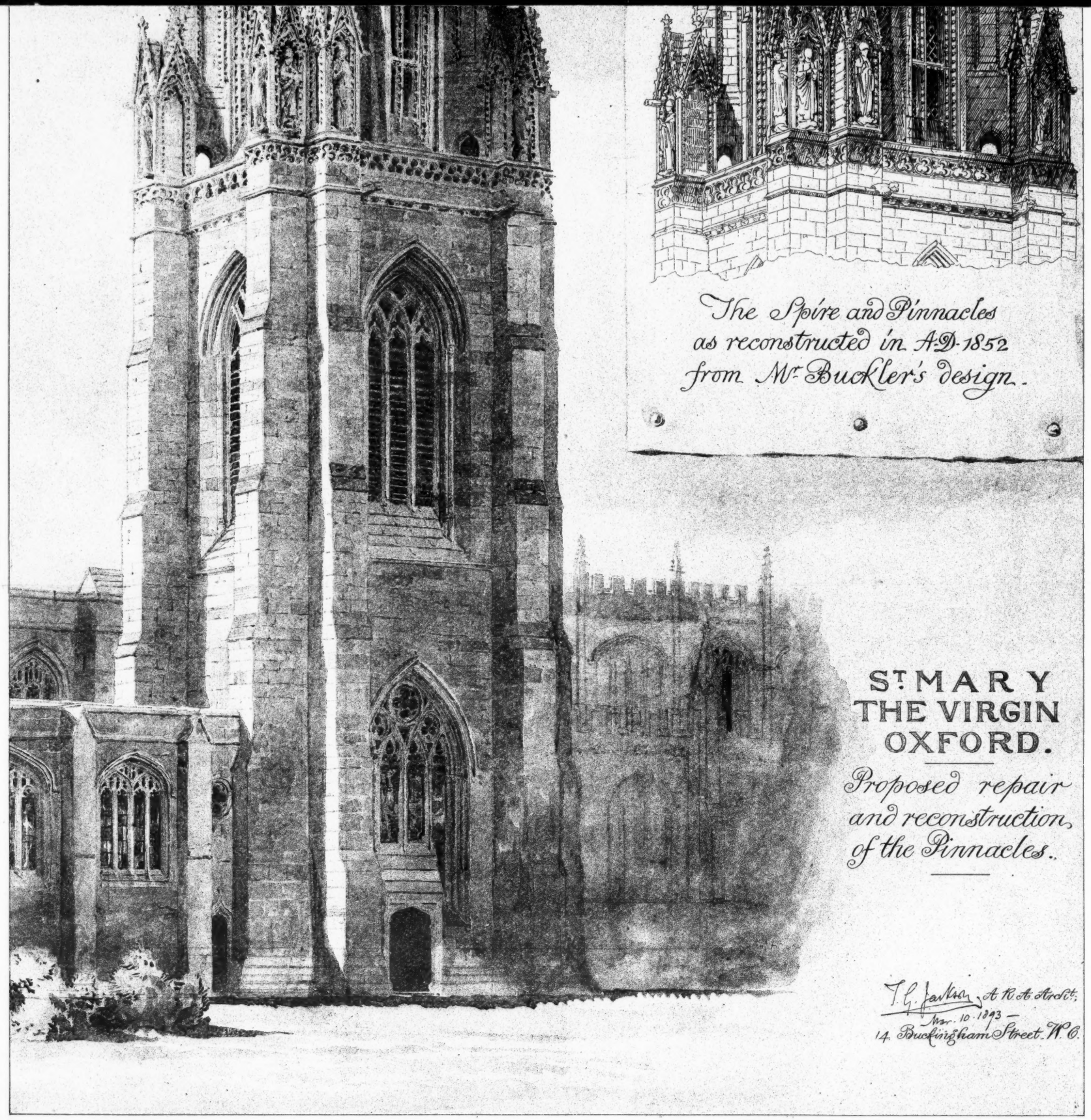

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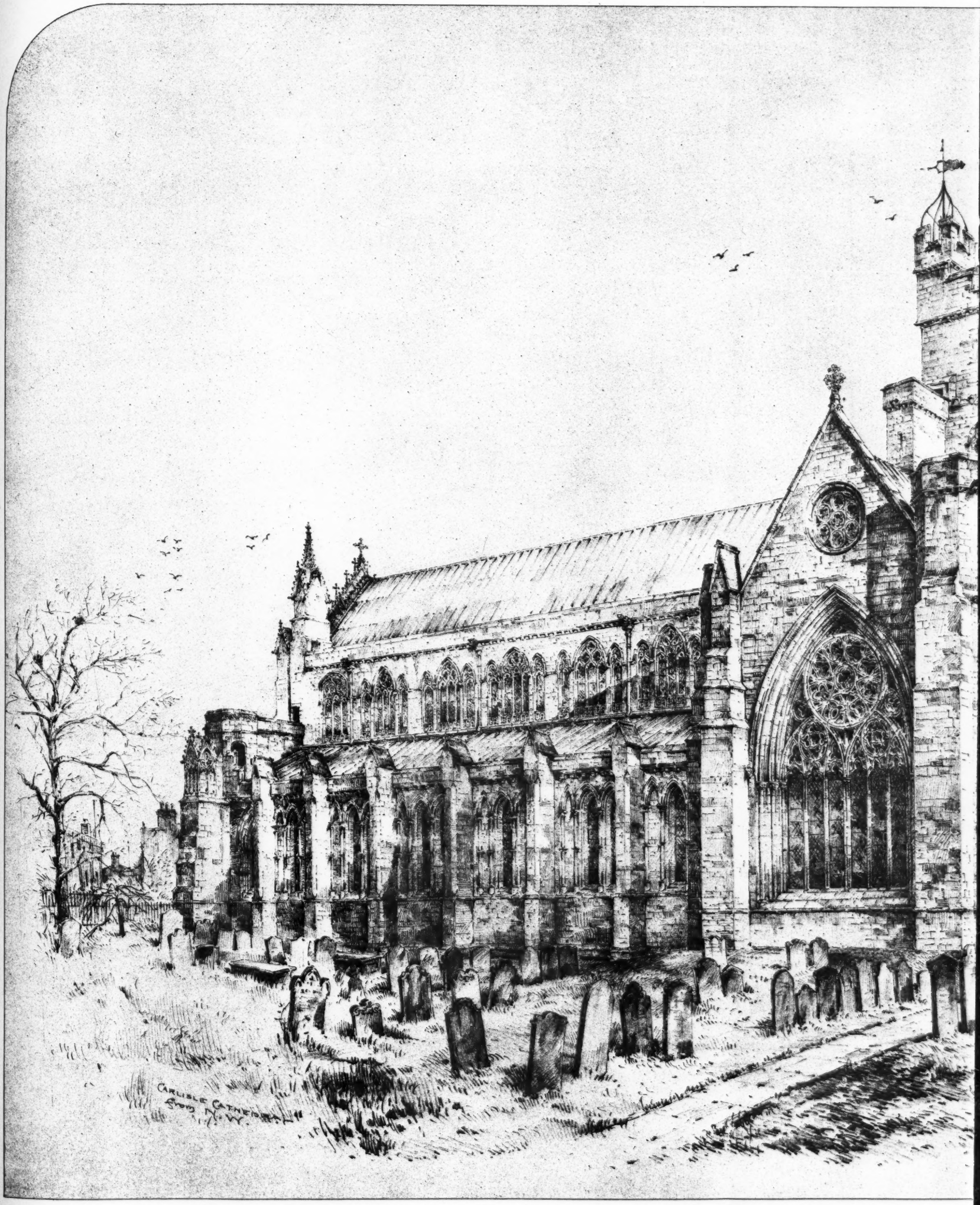

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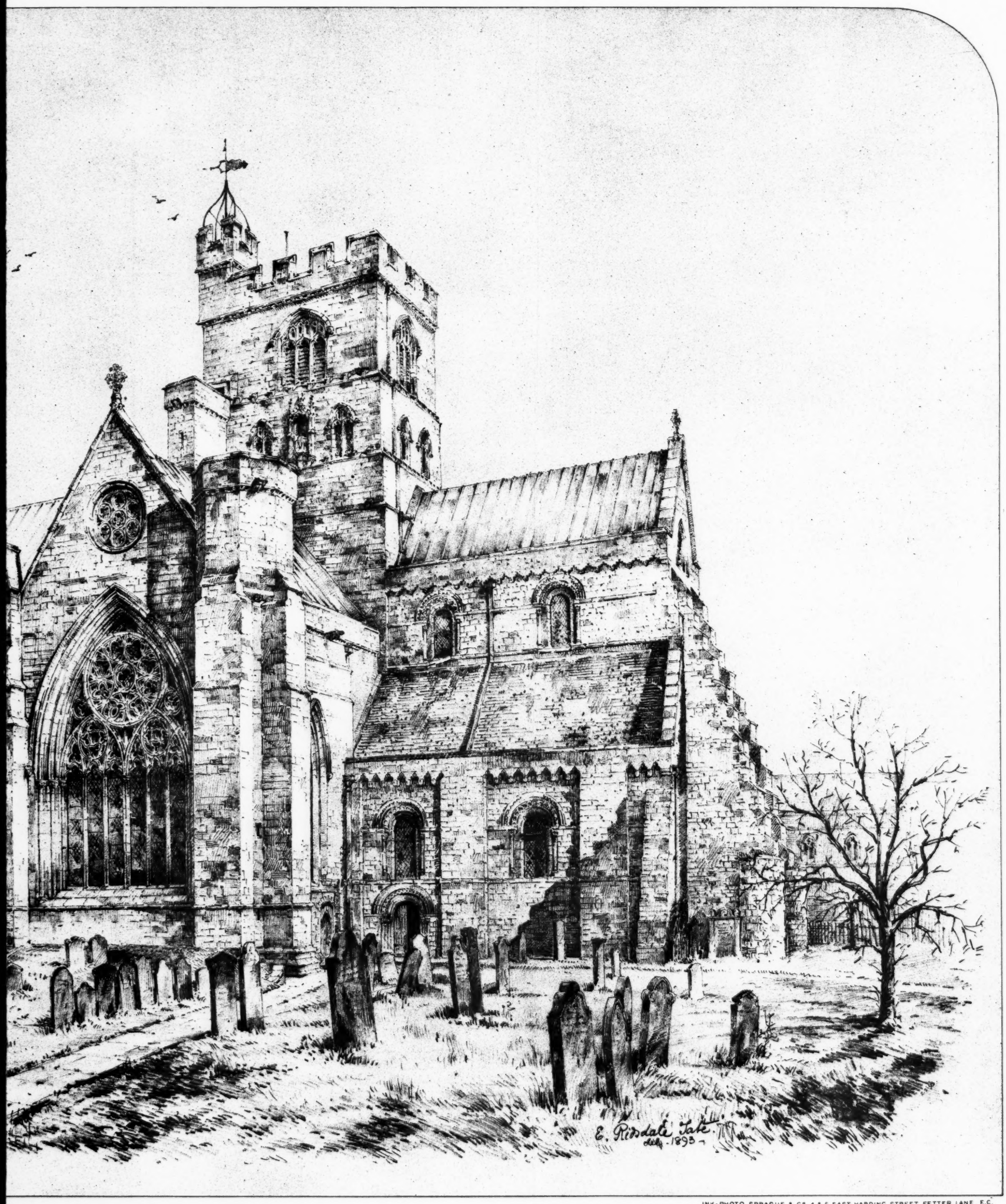

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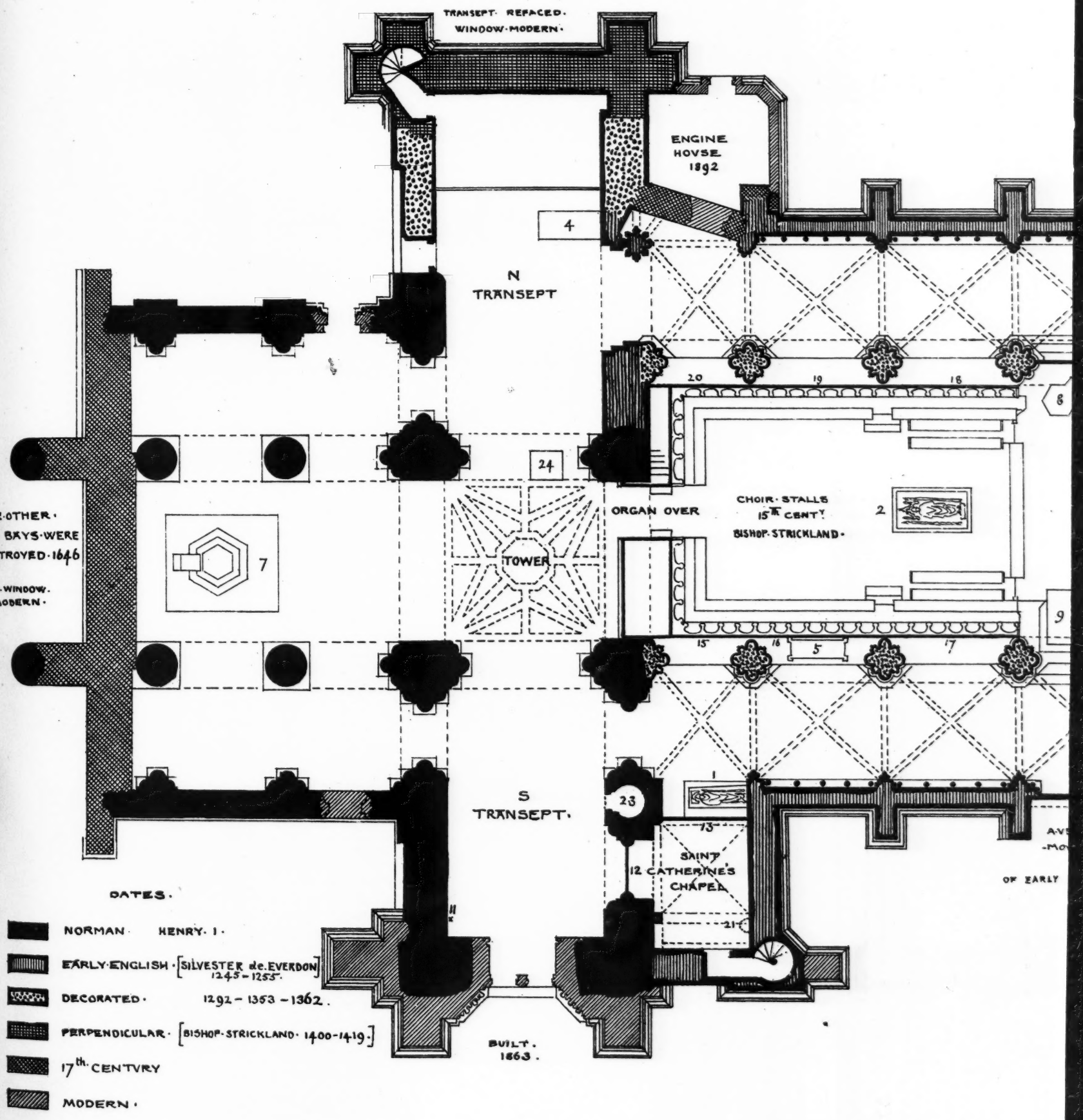

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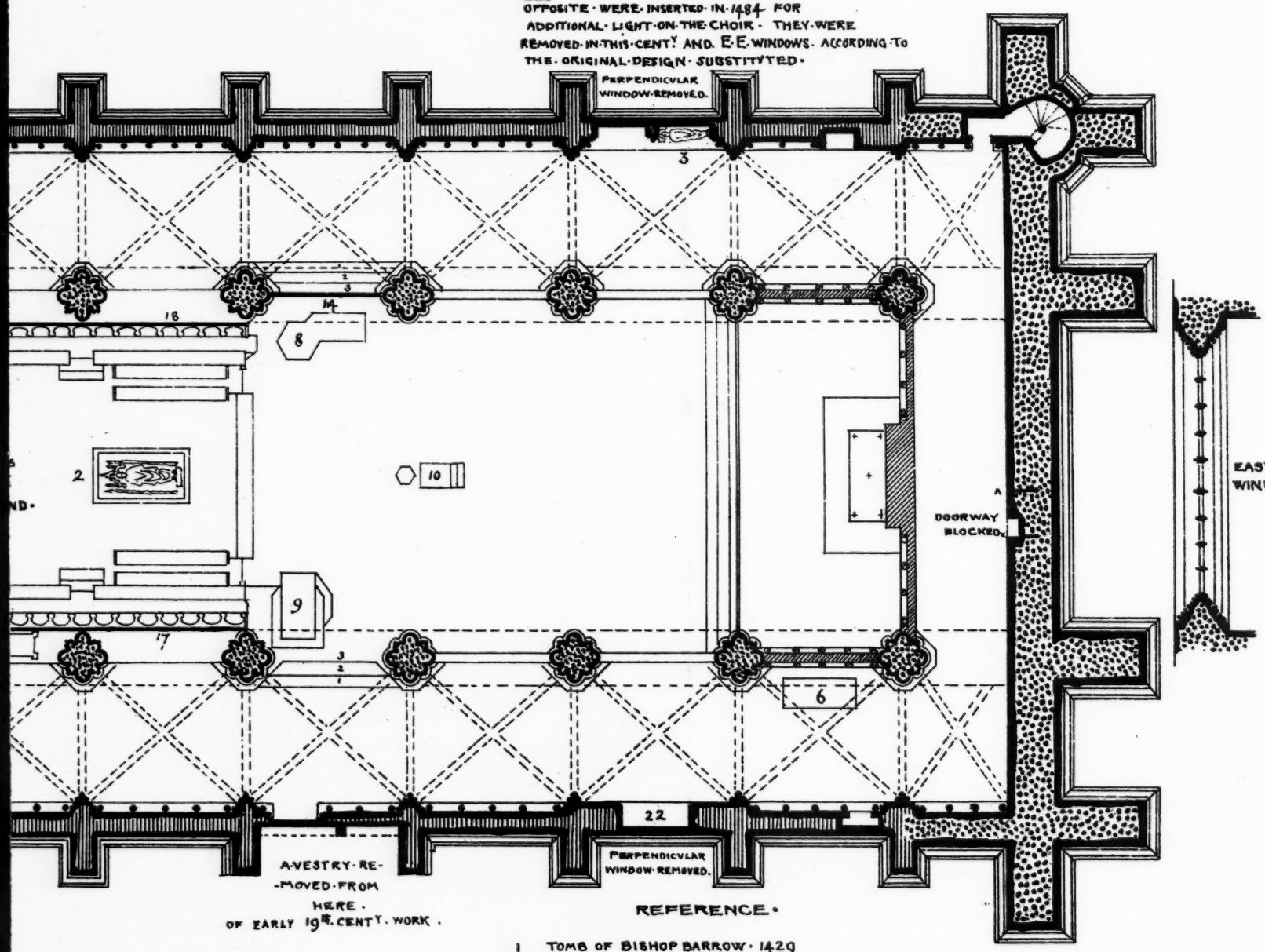
10 5 0 10 20 30 40 50 100 FEET

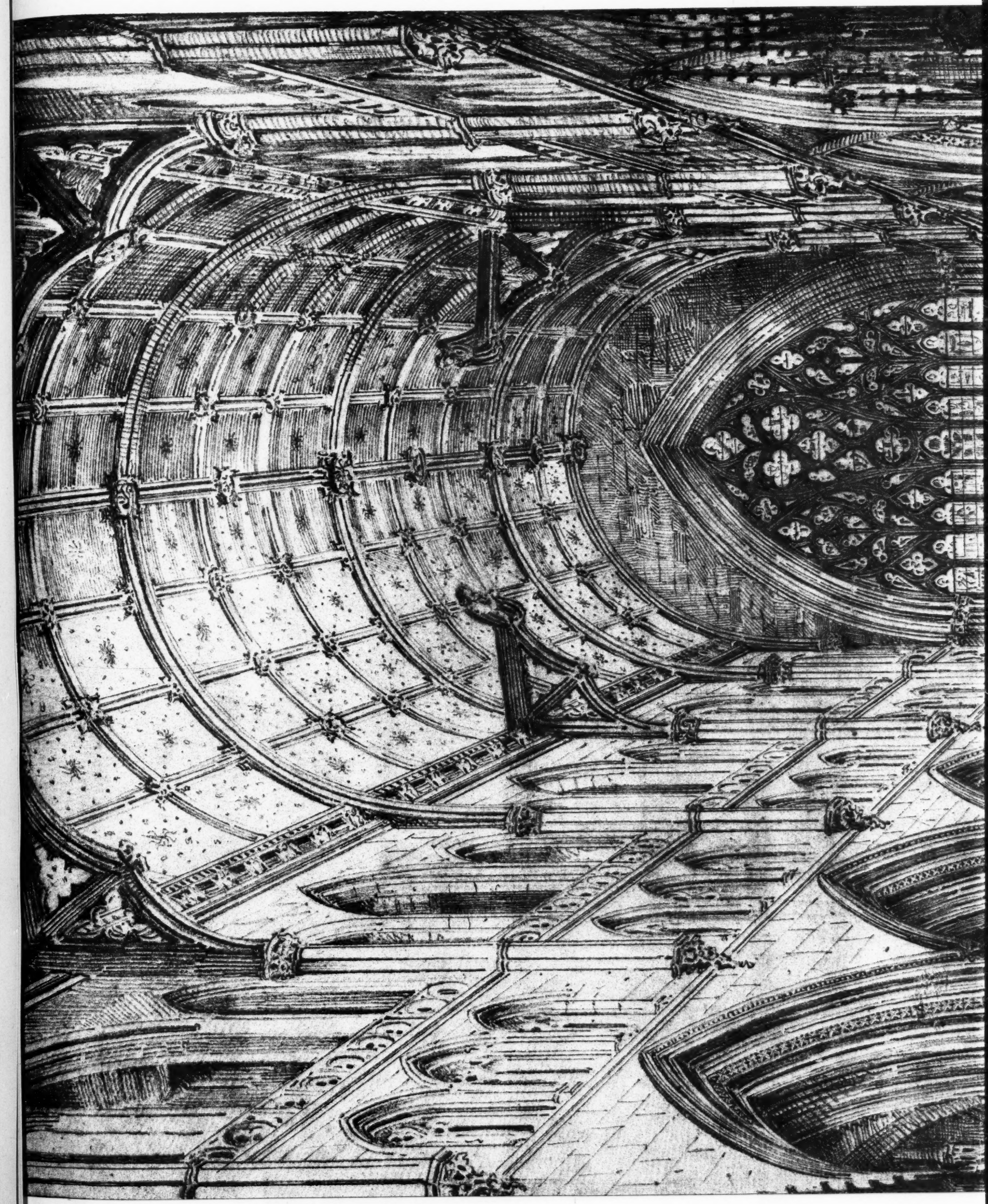
SCALE


NOTE. THIS PERPEN.R WINDOW, & THAT OPPOSITE WERE INSERTED IN 1484 FOR ADDITIONAL LIGHT ON THE CHOIR. THEY WERE REMOVED IN THIS CENT.Y AND E.E. WINDOWS. ACCORDING TO THE ORIGINAL DESIGN SUBSTITYTED.
PERPENDICVLAR WINDOW REMOVED.
EAST WINDOW.
DOORWAY BLOCKED.
PERPENDICVLAR WINDOW REMOVED.
A VESTRY RE-MOVED FROM HERE. OF EARLY 19TH. CENT.Y WORK.

REFERENCE.

1 TOMB OF BISHOP BARROW. 1429
2 BRASS EFFIGY OF BISHOP BELL. 1496.
3 EFFIGY OF BISHOP DE EVERDON 1255 OR BISHOP IRTON.
4 TOMB OF SIMON SENHOVSE. PRIOR IN THE REIGN OF HENRY VII.
5 " " FRANCIS CLOSE DEAN. D. 1882
6 " " SAMVEL WALDEGRAVE BISHOP. D. 1869.
7 MODERN FONT.
8 PVLPIT.
9 BISHOPS THRONE. MODERN.
10 LECTERN.
11 ON WALL AT X A RVNIC SCRIBBLE. "DOLFIN WROTE THESE RVNES."
12, 13 WOODEN SCREENS. PRIOR GONDIBOVR 1484.
14 RENAISSANCE SCREEN. PRIOR SALKELD. 1532.
15–20 LEGENDARY PAINTINGS AT THE BACK OF THE STALLS — 12 APOSTLES. LEGEND OF S. ANTHONY. LEGEND OF S. AVGVSTIN. LEGEND OF S. CVTHBERT. PRIOR GONDIBOVR. 15TH CENTY
21 STONE BRACKET FOR FIGVRE.
22 TOMB OF SIR JOHN SKELTON ?
23, 24 WELLS

This plan was prepared from an outline plan that Mr. Ferguson made 40 years ago. The fittings & modern additions measured by
Francis D. Bedford.
March 1893.



INK PHOTO SPRAGUE & Co 4 & 5 EAST HARDING STREET FETTER LANE E.C.

CARLISLE CATHEDRAL: VIEW IN CHOIR.—From a Drawing by Mr. F. D. Bedford, A.R.I.B.A.